

SHOUT
SHARE IT



Historic, archived document

Do not assume content reflects current
scientific knowledge, policies, or practices.



BULLETIN No. 670

Contribution from Office of Public Roads and Rural Engineering,
LOGAN WALLER PAGE, Director.



Washington, D. C.

PROFESSIONAL PAPER

June 14, 1918

THE RESULTS OF PHYSICAL TESTS OF ROAD-BUILDING ROCK IN 1916 AND 1917.

By PRÉVOST HUBBARD, *Chemical Engineer*, and FRANK H. JACKSON, JR., *Assistant Testing Engineer*.

CONTENTS.

	Page.		Page.
Crushing strength or compression test.....	1	Table III.—Geographical distribution of rock samples tested to January 1, 1918.....	28
Interpretation of results of physical tests.....	2	Table IV.—General limiting test values for broken stone.....	29
Table I.—Results of physical tests of road-building rock in 1916 and 1917.....	3		
Table II.—Results of compression tests of rock made prior to January 1, 1916.....	24		

This bulletin supersedes United States Department of Agriculture Bulletin 537 and supplements Bulletin 370, which gives the results of the more common physical tests of some 3,650 road-building rock samples, examined prior to January 1, 1916. Tests of 655 additional samples examined in 1916 and 1917 are recorded in Table I, the rocks being classified as to their location. It will be noted that in a number of cases, in addition to other tests, the crushing strength of the rock also is given. This test is not made ordinarily when examining rock to determine its suitability for use in the various types of broken-stone roads, but is employed often when considering a rock for use in the manufacture of paving block or as railroad ballast. Table II gives a complete record of all of the crushing strength tests made by the office prior to January 1, 1916. A brief description of this test as made by the office follows.

CRUSHING STRENGTH OR COMPRESSION TEST.

This test is made upon a cylindrical test specimen 2 inches in diameter and 2 inches high. Both ends of the specimen, which have been sawed at right angles to the axis of the cylinder, and properly faced, are bedded in plaster of Paris. The cylinder then is crushed in a 200,000-pound universal testing machine. A small 2-inch spherical bearing block is placed between the moving head of the machine and the upper surface of the specimen. The average of at least two determinations is reported as the crushing strength, calculated in pounds per square inch. Crushing strength tests are made upon samples of road-building rock only when specifically requested.

The percentage variation in strength of 153 granites and gneisses and 156 limestones and dolomites, the total number of these types of rock tested up to January 1, 1918, is shown graphically in Figure 1. In this chart the percentage of total samples tested having various values for crushing strength are plotted as indicated. As an example, the chart shows that 7 per cent of all granites and gneisses tested have a crushing strength of 21,000 pounds per square inch. The sum of all per cents to the left of the 21,000-pound line totals 50; that is, 50 per cent of all granites and gneisses tested have a crushing strength of less than 21,000 pounds. On the other hand, 7 per cent of all the granites and gneisses show a crushing strength of 20,000 pounds per square inch, and by summing up all the per cents to the right of the 20,000-pound line, it will be seen that 50 per cent of the samples tested have a crushing strength greater than 20,000 pounds per square inch. In other words, the average crushing strength of this type of material lies between 20,000 and 21,000 pounds per square inch. By a similar interpretation, the average crushing strength of limestones and dolomites lies between 18,000 and 19,000 pounds per square inch. Further study of the chart shows that the crushing strength of limestones and dolomites closely approaches that of granites and gneisses.

INTERPRETATION OF RESULTS OF PHYSICAL TESTS.

To interpret the results of the physical tests made of road-building rock, the office has adopted a table of general limiting test values for broken stone for the various types of road construction which is printed on the back of the form for reporting tests. For general reference, these limiting values, together with comments upon limits shown, are given in Table IV. By comparing the results of tests on a sample of rock with the limits shown in the table, a general idea of the types of road construction for which it is best suited may be obtained. Table III contains the total number of rock samples received from the various States which have been tested up to January 1, 1918.

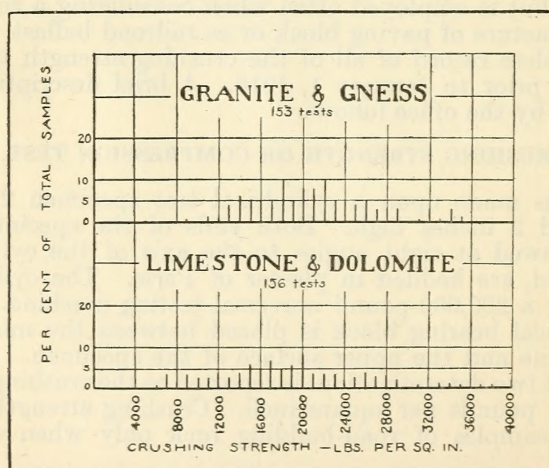


FIG. 1.—Variations in the crushing strength of rock.

TABLE I.—Results of physical tests of road-building rock from the United States and Canada from Jan. 1, 1916, to Jan. 1, 1918.

ALABAMA.

Serial No.	Town or city.	County.	Name of material.	Crushing strength, pounds per square inch.	Weight per cubic foot.	Absorption, pounds per cubic foot.	Per cent of wear.	French coefficient of wear.	Hardness.	Toughness.	Cementing value.
10138	Bridgeport.	Jackson.	Oolitic limestone.	(1)	168	0.21	4.4	9.1	15.7	5	41
9985	Birmingham.	Jefferson.	Limestone.	(1)	168	.55	5.0	8.0	15.3	6	40
11506	Gautts Quarry.	Talladega.	Marble.	(1)	169	.29	5.98	6	9.7	4	(1)

ARIZONA.

11642-A	Tucson (west of)	Pima.	Siliceous limestone.	(1)	166	0.48	5.4	7.4	15.5	5	13
---------	------------------	-------	----------------------	-----	-----	------	-----	-----	------	---	----

ARKANSAS.

12461	Conway.	Faulkner.	Ferruginous sandstone.	(1)	159	0.18	2.6	15.4	17.2	25	(1)
9828	Lamar.	Johnson.	Feldspathic sandstone.	(1)	139	1.98	(1)	(1)	18.7	13	17
12320		Pulaski.	do.	(1)	162	.96	2.5	16.0	18.9	32	15
11511	Peiffer.	Independence.	Marble.	(1)	163	1.06	(1)	(1)	14.0	5	(1)
9838	Fort Smith.	Sebastian.	Sandstone.	(1)	150	3.00	6.5	6.2	15.3	6	25
10186	Gillham.	Sevier.	Feldspathic quartzite.	(1)	164	.42	2.3	17.4	19.0	32	(1)

CALIFORNIA.

11373	San Jose.	Santa Clara.	Feldspathic quartzite.	(1)	172	0.32	1.8	22.2	18.7	18	45
11527	San Francisco.	San Francisco.	Marble.	(1)	176	.35	(1)	(1)	12.0	6	(1)

COLORADO.

9821	Lyons (near).	Boulder.	Argillaceous limestone.	(1)	162	2.98	4.9	8.2	15.3	7	162
9822	Lyons.	do.	Sandstone.	(1)	156	1.73	3.4	11.8	18.3	11	36
9823	Lyons (near).	do.	do.	(1)	156	1.37	2.9	13.7	16.0	14	13
11168	Denver (near).	Jefferson.	Augite andesite.	(1)	169	1.27	2.7	14.8	15.3	17	98
11169	do.	Denver.	Smelter slag.	(1)	216	.65	7.6	5.3	(1)	(1)	6
11170	do.	do.	do.	(1)	217	.50	5.1	7.8	(1)	(1)	7
11171	do.	do.	do.	(1)	217	.86	4.6	8.7	17.3	15	4

1 Test not made.

TABLE I.—*Results of physical tests of road-building rock from the United States and Canada from Jan. 1, 1916, to Jan. 1, 1918—Continued.*

CONNECTICUT.

Serial No.	Town or city.	County.	Name of material.	Crushing strength, pounds per square inch.	Weight per cubic foot.	Absorption, pounds per cubic foot.	Per cent of wear.	French coefficient of wear.	Hardness.	Toughness.	Commenting value.
9944	Plainville.....	Hartford.....	Diabase.....	(1)	184	1.14	2.0	20.0	19.0	23	102
11151	East Haven.....	New Haven.....	Altered basalt.....	(1)	169	.63	3.7	10.8	17.3	10	72
12114-A	Rocky Hill.....	Hartford.....	do.....	33,220	192	.34	2.7	14.8	17.3	21	49
12115-B	North Branford.....	New Haven.....	Diabase.....	(1)	184	.27	4.1	9.8	16.0	12	55
12225	Read's Gap.....	do.....	do.....	10,817	182	.49	3.8	14.3	17.3	11	173
13018	North Branford.....	do.....	do.....	(1)	185	.91	(1)	10.6	15.3	10	(1)
13067	New London.....	do.....	Granite.....	21,840	162	1.74	(1)	(1)	18.7	13	(1)
13068	do.....	do.....	Biotite granite.....	23,850	162	.78	(1)	(1)	18.7	8	(1)
13069	do.....	do.....	do.....	22,170	164	.71	(1)	(1)	18.7	14	(1)
9791	Oneco.....	Windham.....	do.....	16,635	164	.55	(1)	(1)	18.3	8	(1)
11098	do.....	do.....	Gneissoid granite.....	23,200	163	.67	(1)	(1)	18.7	6	(1)
11099	do.....	do.....	do.....	20,200	163	.67	(1)	(1)	18.7	6	(1)
11148	(2).....	do.....	do.....	20,825	163	.44	4.6	8.7	18.7	7	(1)

DELAWARE.

11722	Wilmington.....	New Castle.....	Feldspathic quartzite.....	21,060	(1)	(1)	(1)	(1)	18.7	10	(1)
-------	-----------------	-----------------	----------------------------	--------	-----	-----	-----	-----	------	----	-----

FLORIDA.

10192	Titusville.....	Brevard.....	Shell limestone.....	(1)	155	4.03	7.5	5.3	14.9	2	42
10176	(2).....	Broward.....	Siliceous limestone.....	(1)	(1)	(1)	(1)	(1)	17.3	6	61
10411	Delray (3 miles west).....	Palm Beach.....	Shell limestone.....	(1)	(1)	(1)	50.9	0.8	(1)	(1)	52
10430	Boynton (near).....	do.....	do.....	(1)	(1)	(1)	37.2	1.1	(1)	(1)	40
10431	Jupiter (15 miles west).....	do.....	Siliceous limestone.....	(1)	(1)	(1)	12.5	3.2	14.7	5	43

GEORGIA.

10398	Cartersville (3 miles east).....	Barrow.....	Quartz schist.....	(1)	159	0.71	5.0	8.0	19.3	11	(1)
10399	Cartersville.....	do.....	Ferruginous-sandstone.....	(1)	145	8.74	22.0	1.8	(1)	(1)	(1)
10400	Cass Station (2 miles north).....	do.....	Sandstone.....	(1)	132	2.86	(1)	(1)	18.7	12	(1)

Locality	Distance	Direction	Rock	Weight	Specific Gravity	Hardness	Fracture	Color	Streak	Transparency	Crystal	Other
10645	Carrollton	4 miles north.	Biotite gneiss.	(1)	172	.35	4.7	8.5	17.7	7	(1)	
10646	Carrollton	do.	Granite gneiss.	(1)	165	.62	4.5	8.9	18.7	5	(1)	
10647	Carrollton	2 miles southwest.	do.	(3)	169	.51	4.6	8.7	18.5	6	(1)	
10648	Carrollton	do.	do.	(1)	166	.53	4.8	8.3	18.7	4	(1)	
10649	Carrollton	7 miles northeast.	Biotite gneiss.	(1)	166	.67	(1)	(1)	18.0	10	(1)	
10650	Temple	4 miles east.	do.	(1)	169	.56	7.7	5.2	17.0	5	(1)	
10651	Carrollton	4 miles southeast.	Biotite schist.	(1)	168	.51	5.7	7.0	18.9	8	(1)	
10652	Maury	do.	Epidote hornblende schist.	(1)	192	1.12	5.5	7.3	17.7	9	(1)	
10653	Robyville	do.	Mica schist.	(1)	168	.75	(1)	(1)	16.7	5	(1)	
10654	Bowden	1 mile north.	Amphibolite.	(1)	187	1.20	19.0	2.1	10.5	4	(1)	
10655	Ball Ground	do.	Marble.	(1)	169	.29	12.42	3.22	8.0	3	(1)	
11529	Holly Springs	do.	Serpentine marble.	21,850	178	.40	(1)	(1)	12.6	6	(1)	
10417	Athens	do.	Biotite granite.	(1)	165	.68	6.4	6.3	18.7	6	(1)	
10422	Athens	4 miles west.	do.	(1)	163	1.56	(1)	(1)	15.4	4	(1)	
10423	Athens	4 miles from.	do.	(1)	163	.58	4.4	9.1	16.8	9	(1)	
10420	Athens	do.	do.	(1)	167	.47	5.9	6.8	18.7	4	(1)	
10421	Athens	do.	Granite gneiss.	(1)	169	.76	7.5	5.3	17.7	6	(1)	
10421	Marietta	1½ miles south.	Biotite gneiss.	(1)	167	.65	(1)	(1)	18.7	6	(1)	
10377	Cobb	do.	do.	(1)	170	.67	6.5	6.2	17.3	6	(1)	
10378	Chattahoochee River	do.	do.	(1)	165	.26	5.1	7.8	18.6	8	(1)	
10380	Lost Mountain Store.	do.	Hornblende gneiss.	(1)	188	.93	(1)	(1)	13.3	4	(1)	
10381	Southeast Kennesaw Mountain.	do.	Feldspathic gneiss.	18,500	167	.73	(1)	(1)	18.7	6	(1)	
10382	Marietta	4 miles northwest.	Biotite gneiss.	14,000	169	.50	5.6	7.1	17.3	6	(1)	
10387	Acworth	½ mile south.	do.	(1)	175	.68	8.6	4.7	16.7	5	(1)	
10388	Acworth	4 miles south.	do.	(1)	174	.59	10.1	3.9	16.7	5	(1)	
10389	Anstell	3 mile west.	Granite gneiss.	12,890	163	.56	7.4	5.4	18.7	5	(1)	
10393	Blackwell Station	1 mile north.	Hornblende gneiss.	17,350	184	.42	4.9	8.2	17.3	7	(1)	
10394	Kennesaw Mountain	(north of).	do.	(1)	180	1.05	(1)	(1)	18.0	7	(1)	
10379	Smyrna	3½ miles west.	Magnetic quartzite.	(1)	172	.84	(1)	(1)	18.0	7	(1)	
10395	Kennesaw Station	4 miles southwest.	Amphibolite.	(1)	191	.46	5.3	7.5	15.3	5	(1)	
9869	Lela.	do.	Siliceous shell limestone.	(1)	125	2.51	22.2	1.8	19.3	12	(1)	
111204	Dacula.	do.	Biotite gneiss.	(1)	162	.65	3.8	10.5	18.0	6	(1)	
111205	do.	do.	Granite.	(1)	161	1.07	7.3	5.5	18.0	6	(1)	
111206	do.	do.	Biotite gneiss.	(1)	168	.73	5.3	7.6	17.3	9	(1)	
12078	Stone Mountain.	do.	Granite.	11,220	164	.63	4.5	8.8	17.3	7	(1)	
11940	Lithonia.	do.	do.	(1)	163	.43	4.6	8.7	17.9	6	(1)	
11941	do.	do.	do.	21,280	165	.50	3.2	12.5	18.0	12	(1)	
11942	do.	do.	do.	15,325	163	.51	4.7	8.5	17.8	6	(1)	

1 Test not made.

² Exact locality not known.

TABLE I.—*Results of physical tests of road-building rock from the United States and Canada from Jan. 1, 1916, to Jan. 1, 1918—Continued.*

GEORGIA—Continued.

Serial No.	Town or city.	County.	Name of material.	Crushing strength, pounds per square inch.	Weight per cubic foot.	Absorption, pounds per cubic foot.	Per cent of wear.	French coefficient of wear.	Hardness.	Toughness.	Cementing value.
11943	Lithonia.	Dekalb.	Granite.	17,830	163	.63	4.0	10.0	18.2	7	()
10197	Beach Creek Bridge.	Floyd.	Calcareous shale.	()	163	2.14	()	()	10.7	8	()
10199	Lavender Mountain.	do.	Sandstone.	()	163	1.47	()	()	17.7	29	()
10198	Hufaker Station.	do.	Limestone.	()	170	.22	3.6	11.1	16.0	6	()
10200	Rome (3 miles north).	do.	Argillaceous limestone.	()	168	.21	5.1	7.8	15.7	12	42
10202	Dozer Creek.	do.	Limestone.	()	170	.44	5.1	7.8	15.7	4	51
10203	Pinson.	do.	do.	()	169	.22	4.9	7.1	15.3	5	36
10211	Rome.	do.	Argillaceous limestone.	()	167	.95	5.6	7.1	14.7	13	39
10221	Armuchee (1 mile south).	do.	Crystalline limestone.	()	168	.35	5.5	7.3	15.0	6	35
10222	do.	do.	Oolitic limestone.	()	168	.20	4.2	9.5	16.0	8	35
10223	do.	do.	Limestone.	()	168	1.12	3.8	10.5	16.7	8	61
10224	Armuchee (southeast of).	do.	Argillaceous limestone.	()	167	.59	4.0	10.0	17.3	16	40
9751	Atlanta (near).	Fulton.	Biotite granite.	()	168	.32	3.7	10.8	18.3	8	17
9761	do.	do.	Gneissoid granite.	()	165	.34	4.7	8.5	18.0	7	15
9764	Atlanta.	do.	do.	()	162	.85	()	()	19.3	8	24
9753	Atlanta (near).	do.	do.	()	168	.35	3.8	10.5	()	()	10
9752	do.	do.	Granite gneiss.	()	165	.53	()	()	18.7	9	15
9754	do.	do.	Biotite gneiss.	()	165	.94	8.4	4.8	17.3	7	21
9755	Atlanta.	do.	Mica gneiss.	()	165	.38	3.0	13.3	18.7	10	19
9756	Atlanta (near).	do.	Granite gneiss.	()	165	.30	4.3	9.3	18.7	7	15
9757	do.	do.	do.	()	165	1.01	()	()	17.2	7	24
9758	do.	do.	do.	()	165	.41	4.1	9.8	19.3	13	20
9759	Atlanta.	do.	do.	()	168	.30	3.8	10.5	18.3	13	20
9760	Atlanta (near).	do.	do.	()	165	.40	3.5	11.4	18.3	9	25
9762	do.	do.	Biotite gneiss.	()	172	1.03	()	()	14.7	4	35
9763	do.	do.	Hornblende gneiss.	()	184	.77	()	()	19.0	7	32
9765	do.	do.	Biotite gneiss.	()	165	.18	5.0	8.0	18.7	6	29
9766	Atlanta.	do.	Granite gneiss.	()	165	.36	3.4	11.8	18.0	9	22
9767	do.	do.	Hornblende biotite gneiss.	()	175	.26	4.4	9.1	16.7	6	21
10396	Fairmount (1/4 mile south).	Gordon.	Limestone.	()	169	.27	5.3	7.5	14.7	5	31
10397	do.	do.	do.	()	170	.08	4.1	9.8	15.3	6	35
10417	Lawrenceville.	do.	Biotite hornblende schist.	()	183	.60	()	()	15.7	5	()
10556	Lawrenceville (12 miles northeast).	Gwinnett.	Hornblende schist.	()	196	.65	6.6	6.1	()	()	()
10553	Lawrenceville.	do.	Granite gneiss.	()	159	.62	4.4	9.0	17.0	5	()
10564	Rosebud.	do.	Biotite gneiss.	()	162	.69	5.6	7.1	18.9	6	()

Locality	Distance	Direction	Rock	Grain	Color	Structure	Texture	Fracture	Bedding	Stratification	Orientation	Remarks
Snellville	do.	do.	Granite	162	7.3	17.7	3	(1)				
Lawrenceville	do.	do.	Granite	165	3.3	19.2	6	(1)				
Lawrenceville (1½ miles east)	do.	do.	Granite	162	8.6	17.7	4	(1)				
Lawrenceville (6 miles southeast)	do.	do.	do.	162	7.2	18.4	6	(1)				
do.	do.	do.	Biotite granite	162	.61	18.0	5	(1)				
Grayson (2 miles east)	do.	do.	Biotite granite	158	.71	18.0	5	(1)				
McPhanney Sheals	do.	do.	Gneissoid granite	162	.71	18.2	4	(1)				
Grayson (southwest of)	do.	do.	Granite	162	.67	17.5	4	(1)				
Langley Quarry	do.	do.	Granite	162	.82	17.5	4	(1)				
Grayson (3 miles southwest)	do.	do.	do.	162	.78	18.3	6	(1)				
Snellville (2 miles southwest)	do.	do.	do.	162	.73	18.3	6	(1)				
Lawrenceville (4 miles west)	do.	do.	Amphibolite	190	.32	15.0	13					
Pendergrass	Jackson	Olivine diabase	184	.09	11.1	19.0	16					
Talno	do.	Granite gneiss	161	1.13	5.2	(1)	5	(1)				
Holder station (near)	do.	Hornblende gneiss	165	.48	4.0	18.3	7	(1)				
Jefferson (4 miles north)	do.	Granite	163	.65	5.6	7.1	5	(1)				
Jefferson (3 miles east)	do.	Hornblende schist	190	.04	(1)	17.0	4	(1)				
Robertsville (1½ miles northeast)	Jones	Argillaceous sandstone	105	19.80	12.2	3.2	(1)					
Montbrook	Levy	Chert	156	2.02	12.5	(1)	8	(1)				
do.	do.	do.	156	2.74	3.5	11.4	3	(1)				
Upper Marietta	Milton	Granite gneiss	167	.56	6.6	18.0	8	(1)				
do.	do.	do.	163	.59	6.9	18.7	6	(1)				
Columbus (4 miles north)	Muscogee	Hornblende gneiss	179	.25	4.5	16.7	5	(1)				
do.	do.	do.	179	.45	5.0	16.7	5	(1)				
Fortson (4 miles south)	do.	Biotite gneiss	167	.48	3.7	18.7	10	(1)				
Fortson (1 mile southwest)	do.	do.	164	.89	5.3	18.7	9	(1)				
Gentian (3½ miles north-east)	do.	do.	163	.50	3.6	18.7	9	(1)				
Columbus (8 miles north)	do.	Granite gneiss	163	.83	4.3	18.7	7	(1)				
Gentian (3½ miles north-east)	do.	Hornblende gneiss	163	.58	3.7	18.7	10	(1)				
Columbus (east of)	do.	Granite gneiss	165	.36	3.9	18.7	7	(1)				
Fortson (2 miles southwest)	do.	Biotite granite	168	.40	4.2	19.3	8	(1)				
Pickens	Marble	Marble	169	.09	15.7	2.54	2	(1)				
Tate	do.	do.	169	.17	13.21	9.3	2	(1)				
do.	do.	do.	169	.33	11.95	10.33	2	(1)				
do.	do.	do.	169	.40	16.98	3.9	2	(1)				
do.	do.	do.	171	.37	10.6	10.33	2	(1)				
do.	do.	do.	169	.40	(1)	8.6	3	(1)				
do.	do.	Siliceous limestone	(1)	(1)	(1)	17.3	6	(1)				

Test not made.

² Exact locality not known.

TABLE I.—Results of physical tests of road-building rock from the United States and Canada from Jan. 1, 1916, to Jan. 1, 1918—Continued.

IDAHO.

Serial No.	Town or city.	County.	Name of material.	Crushing strength, per pounds per square inch.	Weight cubic foot.	Absorption, per pounds per cubic foot.	Per cent of wear.	French coefficient of wear.	Hardness.	Toughness.	Cementing value.
10462	St. Anthony.....	Fremont.....	Basalt.....	(1)	159	4.17	7.2	5.6	16.7	4	(1)

ILLINOIS.

11224	McCook.....	Cook.....	Dolomite.....	(1)	158	2.33	6.0	6.7	(1)	(1)	50
11225	Thornton.....	do.....	do.....	(1)	157	2.43	6.8	5.9	(1)	(1)	66
11872	do.....	do.....	Argillaceous dolomite.	(1)	162	2.27	5.5	7.3	13.6	6	23
12236	Whitehall quarry.....	Johnson.....	Siliceous limestone.	(1)	195	.54	14.7	8.2	14.7	12	40
9730	Aurora.....	Kane.....	Smelter slag.....	(1)	221	.17	2.2	18.2	(1)	(1)	(1)
10307	Kankakee.....	Kankakee.....	Dolomite.....	11,180	158	2.12	8.4	4.8	16.0	5	22
11790	Lehigh.....	do.....	Argillaceous dolomite.	(1)	157	3.08	7.0	5.7	14.3	7	(1)
10208	Fox Township.....	Kendall.....	Dolomite.....	(1)	169	1.67	4.9	8.2	13.3	8	37
11133	Pontiac.....	Livingsston.....	Argillaceous limestone.	(1)	156	2.73	12.9	3.1	(1)	(1)	60
11780	Alton.....	Madison.....	Limestone.....	(1)	166	.93	5.9	6.8	(1)	(1)	39
9827	Joliet.....	Will.....	Dolomite.....	8,130	168	1.18	4.9	8.2	15.1	8	10
10772	Aurora (near).....	do.....	Smelter slag.....	(1)	212	.00	7.3	5.5	18.7	7	

INDIANA.

9688	(2)	Clark.....	Argillaceous dolomite.	(1)	150	5.23	10.3	3.9	0.0	3	53
11082	Brazil.....	Clay.....	Limestone.....	(1)	174	.66	4.3	9.3	17.3	11	48
11018	Milfords.....	Crawford.....	do.....	(1)	167	.56	3.3	12.1	16.3	11	34
11019	do.....	do.....	do.....	(1)	168	.66	3.6	11.1	15.0	7	21
11020	do.....	do.....	do.....	(1)	167	.60	3.5	11.4	15.3	11	28
11021	do.....	do.....	Argillaceous limestone.	(1)	168	1.17	3.0	13.3	15.3	11	36
11022	do.....	do.....	Limestone.....	(1)	168	.37	4.5	8.9	16.7	6	35
11023	do.....	do.....	do.....	(1)	168	.61	4.4	7.7	15.7	7	13
11024	do.....	do.....	Pisolithic limestone.	(1)	158	2.78	5.2	7.7	8.7	4	21
11025	do.....	do.....	Limestone.....	(1)	161	2.59	4.5	8.9	14.7	8	23
9859	St. Paul.....	Decatur.....	Argillaceous limestone.	(1)	168	2.01	4.4	9.1	14.0	5	32
10114	do.....	do.....	do.....	(1)	168	1.01	4.0	10.0	13.3	5	32
11778	do.....	do.....	Limestone.....	(1)	166	1.62	4.7	8.5	12.3	6	(1)
11066	Schneilville.....	Dubois.....	Siliceous limestone.	(1)	169	2.58	3.8	10.5	15.3	12	43
11183	Huntington.....	Huntington.....	Dolomite.....	25,420	163	2.10	4.1	9.7	14.0	7	95
9811	Vernon.....	Jennings.....	do.....	(1)	159	4.30	5.0	8.0	15.3	9	63
10834	do.....	do.....	Limestone.....	(1)	167	2.08	3.9	10.2	15.3	9	37

10847	do.	Dolomite.	149	6.90	8.1	4.9	12.0	4	22
11235	do.	Argillaceous dolomite.	24, 150	3.67	4.8	8.3	12.3	6	71
11236	do.	Dolomite.	27, 490	1.45	5.7	7.0	14.7	11	24
11237	do.	Limestone.	15, 330	1.00	4.5	8.0	13.3	6	59
11238	do.	Argillaceous limestone.	14, 840	9.27	10.9	3.6	8.0	5	27
10256	Bloomington (east of).	Limestone.	141	(1)	(1)	(1)	12.0	5	26
10257	Bloomington.	Argillaceous limestone.	(1)	(1)	(1)	(1)	14.6	5	50
10493	do.	Limestone.	(1)	(1)	(1)	(1)	14.7	7	22
9860	Greencastle.	do.	185	1.03	4.8	8.3	14.7	5	46
11818	do.	do.	168	.66	(1)	(1)	16.7	5	(1)
10727	do.	do.	167	.66	6.9	5.8	16.3	3	26
10519	Fillmore.	do.	160	1.07	7.3	5.5	9.1	6	22
10520	do.	Argillaceous limestone.	159	2.22	(1)	(1)	11.2	6	18
10629	Warrick.	Limestone.	162	2.00	4.5	8.9	13.3	9	40
9935	Ellettsfield.	Dolomite.	139	3.81	6.2	6.3	15.0	8	46
10693	Bluffton.	Limestone.	165	2.89	5.4	7.5	13.5	5	52
10694	(?)	Argillaceous limestone.	166	1.24	3.4	4.5	0.0	3	29
10694	(?)	Argillaceous limestone.	148	8.75	8.9				

IOWA.

11783	Dubuque.	Argillaceous dolomite.	169	1.55	5.7	7.1	15	7	(1)
11614	Council Bluffs.	Limestone.	166	.43	5.4	7.4	15.7	6	17

KANSAS.

9599	Fort Scott (7 miles west of).	Limestone breccia.	7, 380	(1)	(1)	(1)	(1)	(1)	(1)
11689	Lecompton.	Cherty limestone.	157	1.40	9.3	4.3	12.0	5	14
11687	Lawrence (near).	Argillaceous limestone.	158	2.01	6.1	6.6	8.7	4	14
11684	do.	do.	152	3.97	7.6	5.3	4.0	4	13
11683	do.	do.	154	4.40	10.7	3.7	14.7	6	14
11681	Junction City.	do.	119	12.30	31.8	1.3	0.0	2	12
11682	do.	Cherty limestone.	134	10.20	13.0	3.1	14.0	2	(1)
11695	do.	Argillaceous limestone.	149	5.44	13.7	2.9	(1)	(1)	18
11696	do.	do.	164	1.51	5.7	7.0	14.3	7	14
11686	Tonganoxie.	do.	156	2.91	7.6	5.3	11.3	5	16
11692	Neely.	Limestone.	155	2.60	8.3	4.8	15.7	6	10
9790	Beloit.	Argillaceous limestone.	143	6.71	18.2	2.2	4.3	4	33
11678	Helmiok "A."	do.	132	8.85	11.5	3.5	16.7	2	11
11678	Helmiok "B."	do.	122	9.19	30.1	1.3	2.7	3	19
11679	Helmiok "C."	do.	143	6.59	15.0	2.7	0.0	3	14
11680	Helmiok "D."	do.	134	9.25	19.5	2.1	0.0	3	14
11693	Council Grove.	do.	153	3.67	9.1	4.4	11.7	3	11
11691	Topeka.	do.	144	7.76	7.2	5.6	13.3	3	15
11690	do.	do.	151	4.99	7.7	5.2	12.0	6	16
11685	do.	do.	152	4.72	8.7	4.6	10.3	8	16
11676	Levis.	Limestone.	155	1.35	7.0	7.0	13.3	19	15
11688	do.	do.	156	3.14	7.7	5.2	16.5	6	15

¹ Test not made.² Exact locality not known.

TABLE I.—Results of physical tests of road-building rock from the United States and Canada from Jan. 1, 1916, to Jan. 1, 1918—Continued.

KENTUCKY.

Serial No.	Town or city.	County.	Name of material.	Crushing strength, pounds per square inch.	Weight per cubic foot.	Absorption, per pounds per cubic foot.	Per cent of wear.	French coefficient of wear.	Hardness.	Toughness.	Commenting value.
11343	Princeton (near)	Caldwell	Cherty limestone	(1)	164	0.48	4.5	8.9	16.7	8	43
10134	Lexington	Fayette	Argillaceous limestone	(1)	168	.19	6.1	6.6	16.0	4	41
10136	do.	do.	do.	(1)	168	.17	5.5	7.3	12.7	4	34
10451	Coville Springs (near)	Trigg	do.	(1)	167	.45	4.7	8.5	14.2	6	37
9829	do.	(2)	Limestone	(1)	165	1.31	(1)	(1)	13.7	6	40
9830	do.	(2)	Argillaceous limestone	(1)	165	.82	(1)	(1)	13.5	10	44

LOUISIANA.

11241	New Orleans	Orleans	Argillaceous sandstone	(1)	128	11.35	19.1	2.1	14.7	6	(1)
-------	-------------	---------	------------------------	-----	-----	-------	------	-----	------	---	-----

MAINE.

11483	Auburn	Androscoggin	Biotite gneiss	(1)	170	0.58	4.4	9.1	18.0	8	(1)
10219	North Jay	Franklin	Granite	21,260	164	.84	2.7	14.8	19.3	7	13
11416	do.	do.	Biotite gneiss	25,090	(1)	(1)	(1)	(1)	17.3	7	(1)
12283	do.	do.	Granite	(1)	163	.69	4.4	9.1	19.0	11	(1)
9997	Mount Desert	Hancock	do.	19,780	165	.21	3.4	11.8	19.7	9	11
10233	do.	do.	do.	19,220	162	.90	4.1	9.8	18.7	8	14
10234	do.	do.	do.	21,700	180	.67	3.2	12.5	18.7	12	(1)
10988	Ship Harbor	do.	do.	19,780	165	.21	(1)	(1)	19.3	18	(1)
10990	do.	do.	do.	26,800	163	.31	(1)	(1)	18.7	13	(1)
11327	Hallowell	Kennebec	do.	32,450	164	.42	(1)	(1)	19.3	16	(1)
11327	Litchfield	do.	do.	25,380	162	.78	3.0	13.2	18.7	8	(1)
11108	do.	do.	Biotite gneiss	(1)	168	.40	4.0	10.0	19.3	6	(1)
11168	Winslow	do.	Mica schist	(1)	174	.47	4.1	9.8	15.0	8	(1)
11186	Hallowell	do.	Granite	27,760	163	.72	3.2	12.5	18.7	7	(1)
11215	Camden	Knox	Biotite quartzite	18,040	172	.22	3.4	11.8	16.7	11	(1)
9781	St. George	do.	Granite	18,780	(1)	(1)	(1)	(1)	(1)	12	(1)
9865	do.	do.	do.	17,150	(1)	(1)	(1)	(1)	18.8	9	(1)
11418	do.	do.	Biotite granite	25,180	(1)	(1)	(1)	(1)	18.0	10	(1)
10019	Vinal Haven	do.	do.	21,650	165	.25	3.1	12.9	19.3	14	28
9996	Long Cove	do.	Granite	17,540	168	.23	3.3	12.1	19.2	10	30
10249	do.	do.	Biotite granite	22,500	165	.86	3.0	13.3	19.3	13	(1)

10250	do.	d.	22, 330	166	.82	3.5	11.4	19.3	8	(1)	47
9706	Rockland.	do.	(1)	175	.40	4.3	9.3	17.0	4	(1)	
11411	Rockport.	do.	31, 580	(1)	(1)	(1)	(1)	18.0	8	(1)	
11414	Vinal Haven.	do.	32, 090	(1)	1.79	11.4	3.5	19.3	11	(1)	
11404	Richmond.	Sagadahoc.	(1)	163	1.79	4.1	3.5	17.0	5	(1)	
11405	do.	do.	(1)	163	.89	4.1	9.8	18.0	5	(1)	
11406	Bowdoinham.	do.	(1)	165	.89	9.5	4.2	17.3	3	(1)	
11407	Richmond.	do.	(1)	170	1.41	8.4	4.8	17.3	(1)	(1)	
11421	Bowdoinham.	do.	(1)	159	1.63	7.1	5.6	(1)	(1)	(1)	
11422	do.	do.	(1)	163	1.74	12.4	3.2	(1)	(1)	(1)	

MARYLAND.

11335	Raspensburg.	Baltimore.	(1)	186	0.41	3.5	11.4	17.3	15	(1)	
11336	do.	do.	(1)	165	.89	6.7	6.0	15.0	7	(1)	
11556	Bare Hills.	do.	(1)	161	1.02	7.7	5.2	12.3	5	(1)	
10105	Frederick.	do.	(1)	(1)	(1)	3.0	13.3	16.0	5	(1)	
12360	Bel Air (near).	Frederick.	(1)	189	.18	2.6	15.0	18.0	19	(1)	
10021	North Laurel.	do.	(1)	200	.46	3.5	11.4	17.3	8	(1)	32
10101	Dickerson.	Howard.	(1)	(1)	(1)	1.4	28.6	18.5	21	(1)	
11152	Halpine.	Montgomery.	(1)	198	.65	3.1	12.9	16.0	11	(1)	
11153	do.	do.	(1)	171	.42	3.1	12.9	18.7	13	(1)	
11332	do.	do.	(1)	171	.29	3.6	11.1	16.0	9	(1)	51
11342	Cavetown.	Washington.	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	

MASSACHUSETTS.

10016	Great Barrington.	Berkshire.	(1)	175	0.37	5.6	7.1	15.3	4	(1)	43
11508	Lee.	do.	(1)	179	.31	7.2	5.6	11.2	2	(1)	
10288	Otis.	do.	18, 260	166	.71	2.6	15.4	18.0	9	(1)	
12473	Windsor.	do.	(1)	164	.24	3.9	10.3	18.7	12	(1)	
9770	Fall River.	Bristol.	(1)	178	.27	2.7	14.8	18.2	17	(1)	24
10117	Aushnet.	do.	(1)	167	.44	2.4	16.6	19.0	17	(1)	
10217	Scotunk.	do.	(1)	167	.76	4.0	10.0	18.7	12	(1)	17
11413	Beverly.	Essex.	(1)	181	(1)	(1)	(1)	19.3	9	(1)	
12289	do.	do.	(1)	181	.87	(1)	(1)	17.0	18	(1)	
9649	Essex.	do.	(1)	165	.32	3.7	10.8	19.7	10	(1)	9
9630	do.	do.	18, 125	165	.35	4.4	9.1	19.7	10	(1)	17
9651	do.	do.	22, 285	165	.33	3.9	8.2	19.3	7	(1)	13
9652	do.	do.	18, 780	165	.21	3.6	11.1	19.3	11	(1)	13
11215	Lynn.	do.	(1)	165	.28	3.4	11.8	(1)	(1)	(1)	48
12256	Newburyport.	do.	(1)	175	.34	3.6	11.0	18.0	10	(1)	
11268	(?)	do.	(1)	170	.72	3.1	12.9	18.3	10	(1)	
12220	Greenfield.	Franklin.	(1)	185	.33	(1)	(1)	18	30	(1)	17
12215	Westfield.	Hampden.	(1)	185	.14	2.2	18.2	18	26	(1)	131

¹ Test not made.² Exact locality not known.

TABLE I.—Results of physical tests of road-building rock from the United States and Canada from Jan. 1, 1916, to Jan. 1, 1918—Continued.

MASSACHUSETTS—Continued.

Serial No.	Town or city.	County.	Name of material.	Crushing strength, pounds per square inch.	Weight per cubic foot.	Absorption, pounds per cubic foot.	Per cent of wear.	French coefficient of wear.	Hardness.	Toughness.	Cementing value.
11795	Ayres.	Middlesex.	Calcareous quartzite.	(1)	168	0.85	6.0	6.6	11	12	(1)
11796	do.	do.	Granite.	(1)	159	1.34	9.4	4.3	17.7	5	(1)
11871	do.	do.	Biotite gneiss.	(1)	168	.30	4.9	8.2	19.0	7	(1)
11720	Groton.	do.	Granite.	22,540	162	.76	5.2	7.7	18.0	8	(1)
12090-A	Malden.	do.	Altered rhyolite.	(1)	2 169	2.21	22.8	214.3	18.7	(1)	214
12090-B	do.	do.	do.	(1)	2 169	2.21	22.8	214.3	17.3	(1)	214
12088-A	Medford.	do.	Altered diabase.	(1)	3 179	3.28	34.1	39.8	18	(1)	312
12088-B	do.	do.	Fragmental rhyolite.	(1)	3 179	3.28	34.1	39.8	18	(1)	312
12088-C	do.	do.	Altered rhyolite.	(1)	3 179	3.28	34.1	39.8	18.7	(1)	312
12088-D	do.	do.	Altered granite.	(1)	3 179	3.28	34.1	39.8	18	(1)	312
12141-A	Melrose.	do.	Altered rhyolite.	(1)	3 170	3.116	32.6	315.4	19.3	17	318
12141-B	do.	do.	do.	(1)	3 170	3.116	32.6	315.4	18	20	318
12141-C	do.	do.	do.	(1)	3 170	4.116	32.6	313.4	16.7	14	318
12141-D	do.	do.	do.	(1)	3 170	3.116	32.6	313.4	16.7	(1)	318
12253	Chelmsford.	do.	Granite.	(1)	162	.35	4.1	9.7	18	10	(1)
12145-A	Stony Brook.	do.	Altered diabase.	(1)	3 179	3.22	33.5	311.4	17.3	13	(1)
12145-B	do.	do.	Altered granite.	(1)	3 179	3.22	33.5	311.4	18.7	11	(1)
12145-C	do.	do.	Altered rhyolite.	(1)	3 179	3.22	33.5	311.4	(1)	16	(1)
12061-A	Waltham.	do.	Hornblende trachyte.	(1)	2 180	2.32	22.5	216.0	17.3	18	22
12061-B	do.	do.	do.	(1)	2 180	2.32	22.5	216.0	18	18	17
12324	West Townsend.	do.	Granite.	(1)	162	1.14	7.4	5.4	18.7	8	(1)
12063-A	Brookline.	Norfolk.	Altered andesite.	(1)	3 174	3.32	32.0	320.0	18	22	38
12063-B	do.	do.	do.	(1)	3 174	3.32	32.0	320.0	18	(1)	38
12063-C	do.	do.	do.	(1)	3 174	3.32	32.0	320.0	18.7	(1)	38
12063-D	do.	do.	do.	(1)	3 174	3.32	32.0	320.0	18.7	(1)	38
12195	Quincy.	do.	Slate.	(1)	168	.63	4.3	9.3	15.3	18	26
11991-A	Brighton.	Suffolk.	Feldspathic sandstone.	(1)	2 166	2.75	27.1	25.6	18.7	13	(1)
11991-B	do.	do.	do.	(1)	2 166	2.75	27.1	25.6	8.3	4	(1)
12051	do.	do.	Altered trachyte.	(1)	175	.17	5.5	7.2	18.7	(1)	172
12050	Roxbury.	do.	Altered rhyolite.	(1)	168	.43	5.8	6.9	18.7	7	13
12056	do.	do.	Rhyolite breccia.	(1)	167	.18	5.9	6.8	18.7	(1)	13
12089-A	Boston (Roslindale).	do.	Altered rhyolite.	(1)	3 166	3.23	33.2	312.5	19	25	(1)
12089-B	do.	do.	do.	(1)	3 166	3.23	33.2	312.5	18.7	(1)	(1)
12089-C	do.	do.	do.	(1)	3 166	3.23	33.2	312.5	18.3	(1)	(1)
10935	Fayette.	Worcester.	Granite gneiss.	(1)	162	.75	3.0	13.3	18.7	11	(1)
11250	Fitchburg.	do.	Biotite granite.	(1)	166	.79	5.7	7.0	17.9	7	(1)
10089	West Rutland.	do.	Granite.	(1)	164	.16	2.9	13.8	18.6	12	19
10090	do.	do.	do.	(1)	161	.79	6.7	6.0	18.0	7	18
10091	do.	do.	Biotite gneiss.	(1)	168	.89	6.5	6.2	16.3	9	35

MICHIGAN.

9855	Marquette.....	Marquette.....	Hornblende gneiss.....	(1)	184	0.62	(1)	(1)	19.3	22	30
9857	do.....	do.....	Amphibolite.....	(1)	181	.57	(1)	(1)	18.0	17	49
9856	do.....	do.....	do.....	(1)	184	.66	(1)	(1)	18.7	15	32
9975	do.....	do.....	Altered diabase.....	(1)	181	.52	2.1	19.1	19.3	12	57
9976	do.....	do.....	do.....	(1)	175	.42	3.8	10.5	16.0	13	25
9977	do.....	do.....	do.....	(1)	184	.60	3.1	12.9	18.3	11	97
11223	Dundee.....	do.....	Limestone.....	(1)	156	1.32	4.4	15.6	0	4	59
9889	Monroe.....	do.....	Dolomite.....	(1)	175	.64	3.6	11.1	17.0	16	30
9988	do.....	do.....	Argillaceous dolomite.....	11,750	165	3.03	4.2	9.5	(1)	5	22
10041	do.....	do.....	do.....	(1)	175	1.47	3.6	8.5	13.5	5	27
11732	Calcutta.....	Presque Isle.....	Dolomite.....	(1)	172	1.80	4.7	11.1	17.0	17	18
9888	Sibley.....	Wayne.....	Limestone.....	(1)	157	1.88	6.9	5.6	5.9	4	16
			do.....	(1)	159	2.82	12.4	3.2	15.3	6	44

MINNESOTA.

11703	Sauk Rapids.....	Benton.....	Biotite granite.....	(1)	165	0.35	4	10.0	19.0	9	(1)
11704	do.....	do.....	do.....	(1)	163	.48	7	5.7	18.7	7	(1)
11705	do.....	do.....	Hornblende granite.....	(1)	169	.32	3.2	12.5	18.7	8	(1)
11341	Mankato.....	Blue Earth.....	Calcareous sandstone.....	(1)	156	4.8	6.4	6.3	5.3	2	28
10485	Jasper.....	Rock.....	Quartzite.....	(1)	164	.18	2.0	20.0	19.7	17	(1)

MISSISSIPPI.

10287	(4).....	Holmes.....	Sandstone.....	(1)	144	4.70	7.8	5.1	18.0	8	(1)
11791	Brandon.....	Rankin.....	Argillaceous limestone.....	(1)	156	3.08	5.6	7.2	12.0	5	(1)
10098	New Albany.....	Union.....	Sandstone.....	(1)	156	2.58	7.1	3.6	18.7	7	(1)

MISSOURI.

11510	Cassville.....	Barry.....	Marble.....	(1)	169	0.70	5.7	7.0	11.7	3	(1)
10169	West Line.....	Cass.....	Limestone.....	(1)	156	1.09	11.5	2.5	13.5	6	24
10110	(1).....	do.....	do.....	(1)	167	.33	5.9	7.2	14.7	6	31
11309	Kansas City.....	Jackson.....	Marble.....	(1)	165	.66	7.5	5.5	8.3	2	(1)
10251	Hamburg.....	St. Charles.....	Limestone.....	(1)	167	.63	5.2	7.1	12.3	4	37
10232	do.....	do.....	do.....	(1)	164	.90	3.5	10.7	10.7	3	34
10237	Sinclair.....	do.....	do.....	(1)	167	.73	4.0	10.0	16.0	7	25
10238	do.....	do.....	do.....	(1)	167	.75	5.1	7.9	15.3	5	22
11743	University City.....	St. Louis.....	do.....	(1)	158	3.81	5.2	7.7	14.6	7	26
11789	Vigfus.....	do.....	do.....	(1)	163	2.1	6.7	5.9	14.0	5	13

¹ Test not made.² Test made on mixture of A and B.³ Test made on mixture of A, B, C, and D.⁴ Locality unknown.

TABLE I.—Results of physical tests of road-building rock from the United States and Canada from Jan. 1, 1916, to Jan. 1, 1918—Continued.

Serial No.	Town or city.	County.	Name of material.	Crushing strength, pounds per square inch.	Weight per cubic foot.	Absorption, per pounds per cubic foot.	Per cent of wear.	French coefficient of wear.	Hardness.	Toughness.	Commenting value.
9905	Nehawka.....	Cass.....	Argillaceous limestone.....	(1)	168	0.75	4.7	8.5	16.0	6	42
NEW HAMPSHIRE.											
11339	Redstone.....	Carroll.....	Biotite granite.....	21,910	161	0.61	5.7	7.0	18.0	7	(1)
12229	do.....	do.....	Granite.....	(1)	162	.65	6.5	6.2	18.0	7	(1)
9916	Fitzwilliam.....	Cheshire.....	do.....	26,100	165	.32	3.7	10.8	17.7	9	15
9883	Marbleboro.....	do.....	do.....	15,615	165	.36	6.7	6.0	17.3	8	18
9894	do.....	do.....	do.....	15,255	165	.52	5.7	7.0	19.3	6	23
9895	Fitzwilliam.....	do.....	do.....	10,825	165	.33	3.8	10.5	18.7	9	17
11234	Milford.....	Hillboro.....	Biotite granite.....	18,250	163	.81	3.3	12.1	18.3	7	(1)
11419	do.....	do.....	Granite.....	19,800	(1)	(1)	(1)	(1)	18.0	8	(1)
9994	Altenstown.....	Merrimack.....	do.....	18,110	165	.61	2.5	16.0	19.0	11	23
12185	Webb.....	do.....	do.....	(1)	163	2.30	4.4	9.1	17.0	7	(1)
11711	Dover.....	Strafford.....	Siliceous marble.....	(1)	173	.09	4.8	8.3	17.7	15	11
12325	do.....	do.....	Shale.....	(1)	177	.12	(1)	(1)	14.7	13	33
NEW JERSEY.											
12263	Upper Montclair.....	Essex.....	Altered basalt.....	(1)	183	0.20	2.9	13.8	18.7	43	59
10795	Lambertville.....	Hamorton.....	Dabase.....	(1)	183	.46	2.8	14.3	18.7	19	49
12386	do.....	do.....	Gabbroitic diabase.....	(1)	184	.22	3.3	12.1	18.2	29	46
12333	Middle Valley.....	do.....	Hornblende gneiss.....	(1)	180	.11	3.4	11.8	18.0	15	30
11914	Pennington.....	Mercer.....	Altered diabase.....	(1)	182	.24	3.4	11.8	18.3	18	19
11966	Millington.....	Morris.....	Basalt.....	(1)	185	.47	2.2	18.0	16.7	15	77
12421	Morristown.....	do.....	Altered gabbro.....	(1)	170	.71	(1)	(1)	17.7	12	28
9921	Mount Hope.....	do.....	Pyroxene granite.....	(1)	178	.44	2.4	16.7	18.3	9	18
10472	Boundbrook.....	Somerset.....	Altered diabase.....	(1)	184	.06	2.2	18.2	18.7	30	54
12101	do.....	do.....	Basalt.....	(1)	182	.24	2.6	15.2	18.7	35	78
NEW MEXICO.											
9768	Silver City.....	Grant.....	Altered granite porphyry.....	(1)	156	1.73	3.4	11.8	18.6	18	(1)

TABLE I.—Results of physical tests of road-building rock from the United States and Canada from Jan. 1, 1916, to Jan. 1, 1918—Continued.

OHIO.

Serial No.	Town or city.	County.	Name of material.	Crushing strength, pounds per square inch.	Weight per cubic foot.	Absorption, pounds per cubic foot.	Per cent of wear.	French coefficient of wear.	Hardness.	Toughness.	Comminuting value.
9864	Lima.....	Allen.....	Dolomite.....	(1)	165	2.67	3.2	12.5	14.7	7	(1)
10025	do.....	do.....	Argillaceous limestone.....	(1)	168	2.77	3.5	11.4	14.7	12	31
10026	do.....	do.....	do.....	(1)	168	1.96	3.7	10.8	16.0	11	33
10027	do.....	do.....	do.....	(1)	168	2.26	3.6	11.1	15.0	11	34
10305	do.....	do.....	Limestone.....	(1)	169	1.80	4.2	9.5	16.0	6	27
9953	Middletown.....	Butler.....	Basic open-hearth slag.....	(1)	209	2.33	4.1	9.8	(1)	(1)	471
9954	do.....	do.....	do.....	(1)	190	2.74	20.4	1.7	(1)	(1)	191
10316	do.....	Clinton.....	Limestone.....	(1)	171	1.66	5.2	7.6	13.2	4	36
10317	do.....	do.....	Siliceous limestone.....	(1)	167	1.49	6.6	6.1	13.7	5	45
11331	Sandusky.....	Erie.....	Argillaceous limestone.....	14, 615	167	1.38	3.0	13.3	12.9	9	65
10536	Marble Cliff.....	Franklin.....	do.....	(1)	(1)	(1)	(1)	(1)	15.2	6	27
11202	Kenton.....	Hardin.....	Dolomite.....	(1)	167	2.08	2.7	14.8	17.3	15	48
11225	do.....	do.....	do.....	(1)	164	2.35	2.5	16.0	17.0	10	52
11329	Dunkirk.....	do.....	Argillaceous dolomite.....	26, 295	167	2.17	3.4	11.8	13.0	10	44
9883	North Baltimore (Wood County near)	Henry.....	do.....	(1)	168	2.61	5.0	8.0	16.0	10	52
11198	Bellevue.....	Huron.....	Dolomite.....	(1)	156	4.89	4.9	8.2	6.0	5	(1)
11203	Clarksfield.....	do.....	Feldspathic sandstone.....	7, 910	136	7.75	5.3	5.3	(1)	5	21
9854	Ironton.....	Lawrence.....	Blast-furnace slag.....	(1)	181	1.73	7.8	6.9	16.0	6	47
9890	Waterville.....	Lucas.....	Argillaceous dolomite.....	(1)	168	2.36	3.3	12.1	16.3	11	38
9883	do.....	do.....	Dolomite.....	(1)	168	2.04	2.8	14.3	16.3	14	41
11047	White House.....	do.....	Siliceous limestone.....	9, 810	161	2.90	6.2	6.5	9.3	6	35
10337	Piqua.....	Miami.....	Dolomite.....	15, 150	156	2.53	10.3	3.9	11.0	4	30
10338	do.....	do.....	do.....	(1)	178	.97	4.8	8.3	15.0	13	30
10532	Conterville.....	Montgomery.....	Argillaceous limestone.....	(1)	(1)	(1)	(1)	(1)	(1)	3	30
10533	do.....	do.....	do.....	(1)	(1)	(1)	(1)	(1)	(1)	5	24
10535	do.....	do.....	do.....	(1)	(1)	(1)	(1)	(1)	(1)	3	37
9945	Rocky Ridge.....	Ottawa.....	Dolomite.....	13, 360	175	.41	5.4	7.4	10.9	3	37
9973	Limestone.....	do.....	do.....	162	162	(1)	5.5	7.3	12.0	9	38
10539	New Paris.....	Preble.....	do.....	16, 480	167	1.12	3.4	11.8	16.2	6	37
12328	Woodville.....	Sandusky.....	do.....	(1)	160	4.14	7.5	5.3	17.0	6	70
11320	Bloomsville.....	Seneca.....	Argillaceous limestone.....	16, 565	166	2.22	3.6	11.1	12.5	6	38
11328	Middlepoint.....	Van Wert.....	do.....	27, 570	169	1.76	3.8	10.5	15.6	10	61
10340	Lucky.....	Wood.....	Dolomite.....	(1)	162	3.68	7.3	5.5	12.0	6	38
9947	Bowling Green.....	do.....	do.....	(1)	165	1.88	7.5	5.3	12.2	6	33
9957	North Baltimore.....	do.....	do.....	(1)	168	2.08	4.0	10.0	14.3	14	50

OKLAHOMA.

11640	Dewey.....	Washington.....	Argillaceous limestone.....	166	1.10	5.3	7.6	14.0	5	23
11641	do.....	do.....	do.....	164	1.14	5.3	7.6	11.3	5	30

PENNSYLVANIA.

9786	Granite.....	Adams.....	Gabbroitic diabase.....	23,435	(1)	(1)	(1)	15.2	14	(1)
10104	Birdsboro (near).....	Berks.....	Diabase.....	(1)	(1)	1.7	23.5	18.7	13	(1)
11733	Yardley (near).....	do.....	Granite gneiss.....	16,330	(1)	4.0	10.0	18.3	15	(1)
11469	Quakertown.....	Bucks.....	Diabase.....	34,040	(1)	(1)	(1)	18.0	10	(1)
12106	do.....	do.....	Hypersthene diabase.....	(1)	(1)	2.8	14.3	18.3	25	23
11261	Summit Hill.....	Carbon.....	Feldspathic sandstone.....	15,090	(1)	4.7	8.5	18.0	10	(1)
12477	Lehigh Gap.....	do.....	Quartzite.....	(1)	(1)	3.3	12.1	18.7	17	(1)
12478	do.....	do.....	Feldspathic quartzite.....	178	(1)	2.8	14.3	18.7	16	(1)
12181	Catawissa.....	Columbia.....	Feldspathic sandstone.....	167	(1)	2.8	14.3	19.3	17	31
12186	do.....	do.....	do.....	166	(1)	3.2	12.5	19.3	25	24
12361	Conewago.....	Dauphin.....	Diabase.....	188	(1)	2.8	14.3	18.0	20	13
10357	(?).....	Delaware.....	Biotite gneiss.....	(1)	(1)	(1)	(1)	18.0	9	(1)
9773	Connellsville.....	do.....	Siliceous limestone.....	168	(1)	2.8	14.3	17.7	13	85
12379	Union Furnace.....	Huntingdon.....	Marble.....	175	(1)	3.9	10.3	15.7	7	46
11255	Duryea.....	do.....	Calcareous sandstone.....	167	(1)	3.4	11.8	16.7	13	(1)
11352	White Haven.....	do.....	Feldspathic quartzite.....	(1)	(1)	(1)	(1)	(1)	19	(1)
10518	Montoursville.....	Lycoming.....	Argillaceous limestone.....	36,000	(1)	6.6	6.1	16.2	6	27
10672	Jersey Shore.....	do.....	Siliceous limestone.....	23,460	(1)	2.6	15.4	18.2	9	53
12261	Green Lane.....	do.....	Altered slate.....	20,360	(1)	44	17.4	15.4	24	17
10137	South Bethlehem.....	Montgomery.....	Blast-furnace slag.....	169	(1)	2.3	17.4	17.3	3	103
12234	Dalmatia (near).....	Northampton.....	Feldspathic sandstone.....	145	(1)	4.42	9.3	13.7	24	(1)
10429	Mount Carmel.....	do.....	Quartzite.....	(1)	(1)	2.4	16.7	19.5	13	33
9812	Holmesburg.....	do.....	Biotite gneiss.....	163	(1)	3.3	12.1	19.0	7	(1)
11410	do.....	Philadelphia.....	do.....	21,530	(1)	(1)	(1)	19.0	7	(1)
11190	Shohola.....	Pike.....	Feldspathic sandstone.....	25,430	(1)	3.2	12.5	18.7	12	(1)
10345	Confluence.....	Somerset.....	Calcareous sandstone.....	25,250	(1)	3.6	11.1	16.7	7	(1)
				24,790	(1)			16.7	7	(1)

RHODE ISLAND.

10171	Lincoln.....	Providence.....	Granite gneiss.....	170	0.17	3.9	10.3	18.7	12	20
10248	East Providence.....	do.....	Feldspathic sandstone.....	(1)	(1)	3.6	11.1	18.0	12	16
10467	Westerly.....	Washington.....	Granite.....	168	(1)	3.9	10.3	18.7	9	(1)
11398	do.....	do.....	Biotite granite.....	161	(1)	2.4	16.7	19.3	11	(1)
12445	do.....	do.....	Granite.....	31,450	(1)	(1)	(1)	18.7	15	(1)
				18,260	(1)			18.7	15	(1)

*Test not made.

TABLE I.—*Results of physical tests of road-building rock from the United States and Canada from Jan. 1, 1916, to Jan. 1, 1918—Continued.*

SOUTH CAROLINA.

Serial No.	Town or city.	County.	Name of material.	Crushing strength, pounds per square inch.	Weight per cubic foot.	Absorption, pounds per cubic foot.	Per cent of wear.	French coefficient of wear.	Hardness.	Toughness.	Cementing value.
10531	Rion.....	Fairfield.....	Biotite granite.....	25,540	165	0.59	4.4	9.1	18.3	8	(1)
11117	Wimshoro.....	do.....	do.....	22,970	(1)	(1)	(1)	(1)	18	7	(1)
10131	Greenville (17 miles from).....	Greenville.....	Granite.....	(1)	165	.82	4.4	9.1	18.7	8	18
10129	Greenville.....	do.....	Hornblende gneiss.....	(1)	172	.68	8.0	5.0	17.0	6	40
10170	Pletons.....	do.....	Biotite gneiss.....	(1)	166	.75	4.1	9.8	17.7	4	20
11617	Columbia (near).....	Richland.....	Granite.....	21,500	165	.99	3.1	12.9	18.0	8	(1)
12380	Spartansburg.....	Spartansburg.....	Biotite granite.....	8,620	165	.57	6.8	5.9	18.5	6	(1)

SOUTH DAKOTA.

10108	Dell Rapids.....	Minnehaha.....	Quartzite.....	(1)	165	0.41	2.8	14.3	19.3	17	5
10894	Sioux Falls.....	do.....	do.....	(1)	163	.27	1.4	28.6	19.3	17	(1)
10895	do.....	do.....	Olivine diabase.....	(1)	190	.37	2.7	14.8	18.7	18	16
10896	Rowena.....	do.....	Quartzite.....	(1)	164	.28	2.7	14.8	19.3	17	(1)

TENNESSEE.

9992	Maryville.....	Blount.....	Argillaceous limestone.....	(1)	168	0.40	3.8	10.5	16.7	6	49
9993	do.....	do.....	Limestone.....	(1)	168	.30	4.3	9.3	15.7	5	39
10292	New Tazewell.....	Claborn.....	Siliceous limestone.....	(1)	171	1.84	4.2	9.5	13.3	8	31
10326	Harrigate (near).....	do.....	Dolomite.....	(1)	174	.92	3.2	12.5	16.0	14	19
10327	Harrigate.....	do.....	do.....	(1)	171	1.86	3.6	11.1	13.3	7	21
10446	New Tazewell (near).....	do.....	do.....	(1)	172	1.20	4.1	9.8	15.3	9	42
10581	New Tazewell.....	do.....	Siliceous dolomite.....	(1)	170	1.93	4.1	9.8	15.2	9	18
10483	Jamestown.....	Fentress.....	Sandstone.....	(1)	145	3.97	10.8	3.7	15.0	4	(1)
11521	Ashbury.....	Knox.....	Marble.....	16,030	169	.30	6.0	6.7	13.3	2	(1)
11522	do.....	do.....	do.....	(1)	169	.13	7.0	5.7	13.0	3	(1)
11523	do.....	do.....	do.....	9,230	168	.11	(1)	(1)	13.6	4	(1)
11524	do.....	do.....	do.....	(1)	168	.17	6.2	6.5	13.0	3	(1)
1324	do.....	do.....	do.....	29,000	168	.20	5.5	7.3	13.0	3	(1)
9887	Nasrot.....	do.....	Dolomite.....	(1)	178	.40	4.1	9.8	16.0	11	49
10315	Madisonville.....	Monroe.....	Ferruginous sandstone.....	(1)	178	.21	4.0	10.0	17.3	8	(1)
10316	do.....	do.....	Siliceous limestone.....	(1)	169	.46	6.3	6.4	16.7	9	29

TEXAS.

VERMONT.

10317	do.	do.	Limestone.	(1)	167	.77	8.3	4.8	16.7	9	33
10318	do.	do.	do.	(1)	171	.33	4.2	9.5	17.3	8	26
10323	do.	do.	Crystalline limestone.	(1)	168	.33	6.0	6.6	13.3	5	49
10414	(1)	do.	Siliceous dolomite.	(1)	174	1.36	3.3	15.7	12.1	18	29
9734	Pickett.	do.	Argillaceous dolomite.	(1)	168	2.65	4.3	9.3	13.2	12	55
11920	Knoxville.	do.	Marble.	(1)	168	.12	5.5	7.3	13.6	5	(1)
11925	Luttrell.	do.	do.	(1)	170	.17	6.9	5.8	12.3	5	(1)
11526	Amarco.	do.	do.	(1)	168	.25	6.1	6.6	12.6	3	(1)
10014	(2)	Grayson.	Clay limestone.	(1)	134	12.80	(1)	(1)	0.0	2	(1)
12488	Longview.	Grogg.	Ferruginous conglomerate.	(1)	153	9.74	25.8	1.6	9.0	3	47
12489	do.	do.	Ferruginous sandstone.	(1)	178	4.89	13.7	2.9	13.5	6	(1)
12490	do.	do.	do.	(1)	150	7.21	13.9	2.8	11.3	3	81
12491	Cladwater.	do.	do.	(1)	143	9.06	16.6	2.4	3.8	4	28
11317	Bowie.	Montague.	Quartz conglomerate.	(1)	148	4.34	21.6	1.9	(1)	(1)	(1)
11395	Chico (near).	Wise.	Limestone.	(1)	169	.30	5.7	7.0	14.3	4	46
12190	Hardwick.	Caledonia.	Biotite granite.	(1)	165	1.11	(1)	(1)	17.0	8	(1)
10818	Burlington.	Chittenden.	Siliceous dolomite.	(1)	163	.26	3.7	11.1	16.7	13	38
11191	Dorby.	Orleans.	Siliceous limestone.	(1)	171	.46	3.0	13.3	17.3	9	96
9673	Barr.	Washington.	Biotite granite.	(1)	165	.37	2.8	11.3	19.0	9	19
12290	do.	do.	do.	(1)	165	.47	(1)	(1)	18.0	11	(1)
12290	do.	Windsor.	Granite.	(1)	164	.52	(1)	(1)	18.0	11	(1)
11488	Proctor.	Rutland.	Serpentine marble.	(1)	171	.22	(1)	(1)	16.7	6	(1)
11189	do.	do.	Variegated marble.	(1)	177	.17	(1)	(1)	18.0	6	(1)
11190	do.	do.	Black marble.	(1)	171	.32	4.6	8.7	14.3	3	(1)
11191	do.	do.	Marble.	(1)	170	.32	5.9	6.8	11.0	3	(1)
11192	do.	do.	do.	(1)	167	.55	(1)	(1)	(1)	(1)	(1)
11193	do.	do.	do.	(1)	168	.56	16.9	2.4	(1)	2	(1)
11194	do.	do.	do.	(1)	168	.31	7.2	5.6	11.0	2	(1)
11191	do.	do.	do.	(1)	167	.40	9.3	7.7	7.7	2	(1)
11495	do.	do.	do.	(1)	165	.39	10.6	3.8	6.7	3	(1)
11496	do.	do.	do.	(1)	165	.46	(1)	(1)	4.0	3	(1)
11497	do.	do.	do.	(1)	168	.52	6.4	6.2	8.7	3	(1)
11498	do.	do.	do.	(1)	168	.32	(1)	(1)	11.7	3	(1)
11199	do.	do.	do.	(1)	168	.28	7.8	5.1	9.0	3	(1)
11500	do.	do.	do.	(1)	168	.36	4.8	8.3	11.7	4	(1)
11501	do.	do.	do.	(1)	168	.41	7.2	5.5	7.0	3	(1)
11502	do.	do.	Siliceous marble.	(1)	168	.78	(1)	(1)	17.6	21	(1)
11503	do.	do.	do.	(1)	177	.45	(1)	(1)	7.3	4	(1)
11528	do.	do.	Marble.	(1)	168	.45	(1)	(1)	(1)	(1)	(1)

¹ Test not made.² Exact locality not known.

TABLE I.—*Results of physical tests of road-building rock from the United States and Canada from Jan. 1, 1916, to Jan. 1, 1918—Continued.*

Serial No.	Town or city.	County.	Name of material.	Crushing strength, pounds per square inch.	Weight per cubic foot.	Absorption, per pounds per cubic foot.	Per cent of wear.	French coefficient of wear.	Hardness.	Toughness.	Cementing value.
9928	(1)	Albemarle.	Biotite gneiss.....	(2)	175	1.62	5.3	7.5	17.6	7	36
9927	(1)	do.	Hornblende gneiss.....	(2)	193	.98	3.5	11.4	16.3	9	47
9926	(1)	do.	Biotite gneiss.....	(2)	181	.57	5.1	7.8	18.7	7	63
11376	(1)	do.	Sericite-epidote schist.....	(2)	165	.69	5.0	8.0	18.3	7	(2)
11377	(1)	do.	Biotite gneiss.....	(2)	173	1.21	5.4	7.4	18.7	3	(2)
10253	Charlottesville.	do.	Granite gneiss.....	(2)	171	.75	5.4	7.4	17.3	5	24
10172	Clifton Forge.	Alleghany.	Siliceous limestone.....	(2)	166	.48	2.5	16.0	17.6	10	48
9891	Lone Jack Station.	Campbell.	Quartzite schist.....	(2)	159	1.34	12.0	3.3	15.9	(2)	8
11551	do.	do.	Aplite granite.....	(2)	165	.53	5.4	7.4	18.7	7	5
11551	do.	do.	Quartz.....	(2)	162	.71	10.9	3.7	(2)	(2)	(2)
11565	Bocock.	do.	do.	(2)	165	.33	15.0	2.7	(2)	(2)	(2)
11779	Halsey (near).	do.	Hornblende epidiorite.....	(2)	198	.35	3.9	10.2	16.7	9	(2)
10344	Lynchburg.	do.	Quartzite.....	25,885	160	1.20	4.3	6.9	18.6	14	(2)
11251	Lynchburg (near).	do.	Hornblende gneiss.....	(2)	165	.20	5.8	3.9	(2)	(2)	(2)
11362	do.	do.	Hornblende schist.....	(2)	178	.80	10.3	3.9	19.3	8	(2)
9819	Cliff View.	Carroll.	Hornblende gneiss.....	(2)	184	.71	4.4	9.1	18.3	14	31
9820	do.	do.	Hornblende schist.....	(2)	181	1.60	15.8	2.5	14.3	5	109
10115	Boston.	Culpeper.	Altered rhyolite.....	(2)	168	.81	4.7	8.5	19.0	5	(2)
11394	Clintonwood.	Dickenson.	Feldspathic sandstone.....	(2)	158	3.14	5.4	7.4	5.0	6	(2)
9919	Warrenton.	Fauquier.	Amphibolite.....	(2)	187	.76	4.6	8.7	(2)	(2)	44
9920	do.	do.	do.	(2)	181	2.44	5.9	6.7	(2)	(2)	120
9870	do.	do.	Epidote chlorite schist.....	(2)	187	1.46	3.6	11.1	(2)	(2)	43
10304	do.	do.	do.	(2)	185	.63	3.5	11.4	14.7	11	(2)
11266	Bluff City.	Giles.	Quartzite.....	(2)	165	.89	3.1	12.9	(2)	(2)	(2)
11248	do.	do.	Siliceous dolomite.....	(2)	175	.33	3.6	11.1	(2)	(2)	(2)
11412	Forest Hills.	Henrico.	Biotite granite.....	19,270	(2)	(2)	(2)	(2)	18.0	6	(2)
10009	Hamilton (3 mile east of)	Loudoun.	Amphibolite.....	(2)	178	.49	8.9	10.3	17.3	10	17
10099	Luray.	Page.	Argillaceous limestone.....	(2)	167	.75	5.4	7.4	14.3	5	27
10298	Buckland.	Prince William.	Diabase.....	(2)	178	1.75	(2)	(2)	17.3	(2)	35
11549	Buena Vista (near).	Rockbridge.	Limestone.....	(2)	176	.78	2.7	14.8	18.3	23	17
11550	do.	do.	Argillaceous limestone.....	(2)	173	.20	2.4	16.7	17.0	11	22
11719	Castlewood.	Russell.	Limestone.....	(2)	171	1.1	3.9	10.3	17.3	13	22
10930	Gate.	Scott.	Argillaceous limestone.....	(2)	168	.38	4.1	9.7	16.3	3	35
11272	Front Royal.	Warren.	Limestone.....	(2)	171	.57	4.3	9.3	14.3	3	28
10780	Wise.	Wise.	Sandstone.....	(2)	158	2.10	4.5	8.8	18.7	10	(2)

WASHINGTON.

10239	Cook (3 miles north of).	Skamania.....	Basalt.....	(2)	177	0.92	2.6	15.4	18.3	24	14
WEST VIRGINIA.											
11708	Martinsburg.....	Berkeley.....	Limestone.....	(2)	170	0.19	5.9	6.8	14.0	3	15
10064	Martinsburg (south of).	do.....	Dolomite.....	(2)	178	.31	3.6	11.1	16.3	10	29
10069	Butts Store.....	do.....	Feldspathic sandstone.....	(2)	140	3.45	7.2	5.6	18.7	(2)	8
10073	Hedgeville (west of).	do.....	do.....	(2)	165	1.66	7.8	14.3	16.7	(2)	61
10087	Tonahawk (north of).	do.....	Sandstone.....	(2)	156	1.66	7.9	5.1	(2)	(2)	23
10062	Inwood (near).	do.....	do.....	(2)	144	3.19	16.6	2.4	19.3	2	17
10063	Forreldridge.....	do.....	Limestone.....	(2)	168	1.61	6.2	6.5	14.0	4	56
10065	Blairton (near).	do.....	Argillaceous limestone.....	(2)	168	1.19	5.1	7.8	16.7	6	28
10066	Berkeley Station.....	do.....	Limestone.....	(2)	168	.27	6.3	6.4	16.0	4	34
10067	Jones Spring.....	do.....	Siliceous limestone.....	(2)	168	.31	4.4	9.1	17.3	9	44
10068	Bedington (east of).	do.....	Argillaceous limestone.....	(2)	172	.19	4.9	8.2	16.0	10	33
10070	Bunker Hill.....	do.....	Limestone.....	(2)	168	.24	5.1	7.8	16.0	4	34
10071	Niptown.....	do.....	do.....	(2)	168	.43	4.9	8.2	16.0	3	32
10072	Spring Mills.....	do.....	do.....	(2)	168	.27	4.2	9.5	15.0	4	45
10074	Gerrardstown.....	do.....	Argillaceous limestone.....	(2)	172	.46	6.5	6.2	15.7	(2)	22
10075	Bedington (east of).	do.....	do.....	(2)	168	.32	5.6	7.1	(2)	(2)	29
10076	Van Clievesville (south of).	do.....	do.....	(2)	168	.36	5.0	8.0	17.0	9	(2)
10077	Dartesville.....	do.....	Limestone.....	(2)	168	.31	5.0	8.0	15.0	4	33
10078	Tonahawk.....	do.....	Siliceous limestone.....	(2)	168	.27	4.5	8.9	18.3	15	47
10079	Falling water.....	do.....	Limestone.....	(2)	168	1.27	4.7	8.5	16.7	8	20
10080	Little Georgetown.....	do.....	Argillaceous limestone.....	(2)	175	.37	6.5	6.2	18.7	10	24
10081	Jones Spring.....	do.....	Crystalline limestone.....	(2)	168	.37	5.7	7.0	14.0	4	47
10082	Falling water (near).	do.....	Limestone.....	(2)	168	.39	5.6	7.1	(2)	(2)	25
10083	Falling water.....	do.....	Chert and limestone (mixed).	(2)	(4)	(2)	4.7	8.5	(2)	(2)	23
10084	Blairton.....	do.....	Limestone.....	(2)	168	.23	5.9	6.5	16.3	5	30
10085	Cumbo.....	do.....	do.....	(2)	172	.52	4.6	8.7	16.7	4	32
10086	Martinsburg (south of).	do.....	do.....	(2)	168	.56	5.8	6.9	18.0	5	39
10102	Martinsburg.....	do.....	do.....	(2)	(2)	(2)	5.2	7.7	16.7	6	(2)
10511	Scherer.....	do.....	do.....	(2)	166	.60	5.4	7.4	(2)	(2)	31
9925	Renick.....	Grant.....	Argillaceous limestone.....	(2)	168	.66	3.8	10.5	16.3	8	41
9972	Fort Spring.....	Greenbrier.....	do.....	(2)	168	.24	4.1	9.8	15.7	9	57
11915	Ronceverte.....	do.....	Limestone.....	(2)	168	.18	4.3	9.3	16.7	11	31
11715	White Sulphur Springs	do.....	do.....	(2)	164	.84	3.2	12.3	18.3	14	(2)
11763	(1)	do.....	Feldspathic sandstone.....	(2)	165	.82	3.0	13.3	18.7	14	(2)
10103	Kearneyville.....	do.....	do.....	(2)	(2)	(2)	2.7	14.8	14.0	6	(2)
11009	(1)	Jefferson.....	Limestone.....	(2)	177	.40	4.5	8.9	16.7	6	18
9966	Greer.....	do.....	Dolomite.....	(2)	168	.73	4.7	8.5	15.7	8	40
9967	do.....	Monongalia.....	Argillaceous limestone.....	(2)	168	.59	4.7	8.5	15.7	9	63

2 Test not made.

1 Exact locality not known.

TABLE I.—Results of physical tests of road-building rock from the United States and Canada from Jan. 1 1916, to Jan. 1, 1918—Continued.

WEST VIRGINIA—Continued.

Serial No.	Town or city.	County.	Name of material.	Crushing strength, pounds per square inch.	Weight per cubic foot.	Absorption, pounds per cubic foot.	Per cent of wear.	French coefficient of wear.	Hardness.	Toughness.	Commenting value.
9968	Greer	Monongalia	Argillaceous limestone	(1)	168	0.73	4.8	8.3	14.0	9	37
9969	do.	do.	Siliceous limestone	(1)	168	.56	3.0	13.3	16.7	10	47
10318	Albright (near)	Preston	Sandstone	(1)	154	1.88	8.1	4.9	17.3	5	(1)
10349	Albright	do.	Ferruginous sandstone	(1)	160	2.40	4.0	10.0	15.3	9	(1)
11171	Lester (near)	Raleigh	Sandstone	(1)	150	3.60	9.5	4.2	13.3	5	(1)
11172	Beckley	do.	do.	(1)	156	3.07	3.1	12.9	15.0	6	(1)
11473	Surveyor	do.	do.	(1)	155	2.74	4.2	9.5	18.0	6	(1)
11544	Ghent	do.	do.	(1)	158	2.32	8.2	4.9	17.3	8	(1)
11545	Cherry Glade	do.	do.	(1)	152	3.14	8.2	4.9	16.7	4	(1)
11546	Daniels	do.	do.	(1)	155	2.24	4.8	8.3	16.7	7	(1)
11547	Shady Springs	do.	do.	(1)	156	2.44	4.9	8.2	18.0	6	(1)
11736	Bolt	do.	Quartz conglomerate	(1)	131	3.23	31.6	1.3	(1)	(1)	4
11130	Trap Hill District	do.	Sandstone	(1)	134	3.69	3.9	10.3	16.6	9	(1)
10336	Spencer (near)	Roane	Feldspathic sandstone	(1)	156	3.52	12.3	3.3	8.7	4	32
10509	Davis	Tucker	Siliceous limestone	(1)	167	.05	3.7	10.8	14.3	10	30
10510	do.	do.	Argillaceous limestone	(1)	168	.12	5.0	8.0	16.3	6	37

WISCONSIN.

1971	Springdale	Dane	Dolomite	(1)	172	1.27	3.7	10.8	16.0	12	21
9999	Berlin	Green Lake	Rhyolite	(1)	165	.16	1.9	21.3	19.0	25	15
10168	Buffalo	Marquette	Altered syenite	(1)	167	.13	2.2	18.2	19.3	30	13
10014	Wauwatosa	Milwaukee	Argillaceous dolomite	(1)	168	2.11	3.7	2.8	14.7	8	(1)
11129	Wauwatosa (near)	do.	do.	16, 700	168	2.01	3.8	10.5	15.3	11	62
11367	do.	do.	do.	20, 370	163	3.2	2.1	19.0	14.0	8	18
10986	Wells	Montroe	Argillaceous limestone	(1)	162	2.79	4.6	8.3	18.0	9	(1)
9970	Black Creek	Outagamie	Calcareous sandstone	(1)	178	.58	4.8	8.7	14.7	5	31
9971	do.	do.	Dolomite	(1)	178	.53	4.1	9.8	15.3	8	31
10022	Belgium	Ozaukee	Argillaceous dolomite	(1)	175	1.15	7.4	5.5	14.3	8	30
11625	Mequon	do.	Dolomite	22, 750	174	1.09	3.4	11.8	12.3	7	46
11638	do.	do.	do.	(1)	178	1.13	5.6	7.1	15.0	7	(1)
11447	Red Granite	Waushara	Granite	(1)	178	1.33	1.4	28.5	19.3	14	3
10159	Grand Rapids	Wood	Sandstone	(1)	165	.91	3.3	12.1	18.3	5	37
10028	(?)	(?)	Dolomite	(1)	168	1.05	7.1	5.6	13.3	6	41

CANADA.

11648	Ottawa (south of).....	Argillaceous dolomite	(1)	166	3.05	4.8	8.3	13.7	4	18
11649	Ottawa (east of).....	Limestone	(1)	167	.76	4.9	8.2	12.0	4	27
9746	Welland.....	do.....	(1)	165	.75	2.9	8.2	12.0	4	27
11650	Welland.....	Cherty limestone.	(1)	167	.54	2.9	10.7	18.3	13	82
11651	Hull (near).....	Diabase	(1)	184	.54	2.9	10.7	18.0	13	28
10017	Montreal.....	Nephelite syenite	(1)	156	.60	2.2	18.7	18.7	10	22
10332	Wellesley Island.....	Biotite granite.	(1)	165	.28	2.9	13.2	18.0	10	(1)

Test not made.

³ Exact locality unknown.

TABLE II.—*Results of compression tests of rock, made prior to Jan. 1, 1916.*

ARKANSAS.

Serial No.	Locality.	County.	Name.	Crushing strength, pounds per square inch.
6331	Bald Knob.....	White.....	Sandstone.....	19,860

CONNECTICUT.

9791	Oneco.....	Windham.....	Biotite granite.....	16,635
------	------------	--------------	----------------------	--------

ILLINOIS.

4422	Embarras.....	Coles.....	Limestone.....	17,300
5509	Thornton.....	Cook.....	Dolomite.....	23,060
6053	do.....	do.....	do.....	16,880
8711	Hillside.....	do.....	Argillaceous dolomite.....	15,730
4660	Tunnel Hill.....	Johnson.....	Sandstone.....	19,150
7509	Reevesville.....	do.....	Argillaceous limestone.....	23,780
7510	do.....	do.....	do.....	28,400
4764	Kankakee.....	Kankakee.....	Dolomite.....	20,610
5550	do.....	do.....	do.....	17,710
6088	do.....	do.....	Argillaceous dolomite.....	20,830
6165	do.....	do.....	Dolomite.....	11,660
6865	do.....	do.....	do.....	13,500
7298	do.....	do.....	Argillaceous dolomite.....	25,850
7299	do.....	do.....	do.....	20,000
7300	do.....	do.....	do.....	19,800
7301	do.....	do.....	do.....	19,700
7302	do.....	do.....	Dolomite.....	17,050
7871	Lehigh.....	do.....	Argillaceous Dolomite.....	16,700
4421	Alton.....	Madison.....	Limestone.....	15,100
7422	Brookville.....	Ogle.....	Argillaceous dolomite.....	18,640
7423	do.....	do.....	do.....	18,180
5549	Anna.....	Union.....	Limestone.....	19,510

INDIANA.

5534	Loganport.....	Cass.....	Limestone.....	20,350
4655	Greensburg.....	Decatur.....	Dolomite.....	17,960
4658	St. Paul.....	do.....	Limestone.....	18,400
4690	Westport.....	do.....	Dolomitic limestone.....	20,000
4659	St. Paul.....	do.....	do.....	20,510
5088	do.....	do.....	Limestone.....	19,800
4197	Mitchell.....	Lawrence.....	Argillaceous dolomite.....	12,250
5027	Bedford.....	do.....	Limestone.....	6,900
5029	do.....	do.....	do.....	6,450
3368	Greencastle.....	Putman.....	do.....	16,000
5737	Osgood.....	Ripley.....	do.....	14,470
4657	Wabash.....	Wabash.....	Dolomitic limestone.....	18,790

IOWA.

5525	Cedar Rapids.....	Linn.....	Dolomite limestone.....	19,950
5526	La Grande.....	Marshall.....	do.....	14,850

KENTUCKY.

5552	Princeton.....	Caldwell.....	Dolomitic limestone.....	23,860
7688	Cedar Bluff.....	do.....	Argillaceous limestone.....	25,720
5921	Limestone.....	Carter.....	Limestone.....	14,900
5922	Carter.....	do.....	Siliceous limestone.....	13,400

TABLE II.—Results of compression tests of rocks, made prior to Jan. 1, 1916—Contd.

MAINE.

Serial No.	Locality.	County.	Name.	Crushing strength, pounds per square inch.
7438	Swans Island.....	Hancock.....	Biotite granite.....	18,400
8745	Vinal Haven.....	Knox.....	Granite.....	20,020
8768	St. George.....	do.....	do.....	22,800
8769	Vinal Haven.....	do.....	do.....	20,930
8781	St. George.....	do.....	do.....	18,780
9865	do.....	do.....	do.....	17,150
9996	Long Cove.....	do.....	do.....	17,540
9445	Vinal Haven.....	do.....	Biotite granite.....	21,220
10366	St. George.....	do.....	do.....	27,050
7439	Frankford.....	Waldo.....	do.....	20,600

MARYLAND.

5611	Mount Savage Junction.	Allegany.....	Siliceous limestone.....	34,930
4884	Frederick.....	Frederick.....	Limestone.....	17,580
5694	Havre de Grace.....	Harford.....	Gneissoid granite.....	34,410
5695	do.....	do.....	Sericite gneiss.....	20,090
5696	do.....	do.....	Gneissoid granite.....	21,670
5697	do.....	do.....	Amphibolite.....	34,380
5698	do.....	do.....	Gneissoid granite.....	35,210
5699	do.....	do.....	do.....	22,190

MASSACHUSETTS.

6891	Rockport.....	Essex.....	Biotite granite.....	22,370
6892	do.....	do.....	do.....	23,610
6893	do.....	do.....	do.....	22,670
6894	do.....	do.....	do.....	21,600
8796	do.....	do.....	do.....	23,830
5671	Westfield.....	Hampden.....	Altered diabase.....	32,850
8862	Westford.....	Middlesex.....	Granite.....	13,980
8874	do.....	do.....	do.....	17,000
8875	do.....	do.....	do.....	16,250
5988	West Auburn.....	Worcester.....	Mica gneiss.....	21,950

MICHIGAN.

9593	Calcite.....	Presque Isle.....	Limestone.....	10,300
------	--------------	-------------------	----------------	--------

MINNESOTA.

5524	Stockton.....	Winona.....	Argillaceous dolomite.....	16,000
------	---------------	-------------	----------------------------	--------

MISSOURI.

6375	Rochefort.....	Boone.....	Limestone.....	13,900
6377	Sweeney.....	Cooper.....	Argillaceous limestone.....	14,900

NEW YORK.

6457	(1).....	Clinton.....	Plagioclase gneiss.....	18,500
6458	(1).....	do.....	Pyroxene gneiss.....	20,500
8011	(1).....	Dutchess.....	Dolomite.....	34,450
5544	Camelo.....	do.....	do.....	29,050
5872	Akron Junction.....	Erie.....	Cherty limestone.....	16,700
6056	do.....	do.....	do.....	31,180
8577	Gloversville.....	Fulton.....	Biotite gneiss.....	14,585
4157	Alexandria Bay.....	Jefferson.....	Granite.....	21,600
8833	do.....	do.....	do.....	26,180
8902	do.....	do.....	do.....	14,150
9129	do.....	do.....	do.....	14,390
9130	do.....	do.....	Gneissoid granite.....	17,600
7437	do.....	do.....	Granite.....	27,200
8012	(1).....	Rockland.....	Gabbroitic diabase.....	31,300
8013	(1).....	do.....	Siliceous dolomite.....	22,200

¹ Exact locality not known.

TABLE II.—Results of compression tests of rock, made prior to Jan. 1, 1916—Continued.

NEW HAMPSHIRE.

Serial No.	Locality.	County.	Name.	Crushing strength, pounds per square inch.
8872	Melford.....	Hillsboro.....	Granite.....	15,050
9010	do.....	do.....	Biotite granite.....	16,640
9011	do.....	do.....	do.....	14,870
9012	do.....	do.....	do.....	18,230
9031	Concord.....	Merrimack.....	Granite.....	16,600
9036	do.....	do.....	do.....	13,420
9037	do.....	do.....	do.....	13,900
8870	do.....	do.....	do.....	15,100

NORTH CAROLINA.

8396	(1).....	Forsythe.....	Granite.....	13,140
8397	(1).....	do.....	Hypersthene gabbro.....	11,880
8682	Spencer Mountain.....	Gaston.....	Feldspathic quartzite.....	31,520
8881	Gastonia.....	do.....	Quartzite.....	17,100
8576	Mooreville.....	Iredell.....	Biotite granite.....	26,000
5373	(1).....	McDowell.....	Sandstone.....	22,600
9038	Wilson.....	Wilson.....	Granite.....	16,070
5956	Stacey.....	Rockingham.....	Granite gneiss.....	23,220
5496	Sansbury.....	Rowan.....	Granite.....	33,750
6071	Bostic.....	Rutherford.....	Biotite gneiss.....	16,100
5497	Mount Airy.....	Surry.....	Granite.....	18,400
7433	do.....	do.....	do.....	15,200
8901	do.....	do.....	do.....	5,100
9048	do.....	do.....	do.....	16,440
8419	Granita (near).....	Wake.....	Biotite granite.....	14,160
3807	Wise.....	Warren.....	Granite.....	18,240
3808	do.....	do.....	do.....	18,560
5374	(1).....	Yancey.....	Quartzite.....	12,900

OHIO.

4694	Osborne.....	Clark.....	Dolomitic limestone.....	8,690
4695	Springfield.....	do.....	Dolomite.....	18,960
9282	Cleveland.....	Cuyahoga.....	Granite.....	31,790
9283	do.....	do.....	do.....	27,900
9284	do.....	do.....	do.....	24,790
9285	do.....	do.....	do.....	26,990
9459	do.....	do.....	do.....	24,900
4378	Sandusky.....	Erie.....	Limestone.....	19,400
5554	do.....	do.....	do.....	21,850
5753	Castalia.....	do.....	Dolomitic limestone.....	18,530
6055	do.....	do.....	Limestone.....	20,810
5505	Marble Cliff.....	Franklin.....	do.....	16,750
5506	do.....	do.....	do.....	12,350
5630	Columbus.....	do.....	Ferruginous sandstone.....	21,800
4693	Patterson.....	Hardin.....	Dolomite.....	11,360
5553	Dunkirk.....	do.....	do.....	26,200
4707	Hillsboro.....	Highland.....	Cherty limestone.....	15,590
8347	Clarksfield.....	Huron.....	Calcareous sandstone.....	9,490
4656	Big Springs.....	Logan.....	Argillaceous limestone.....	16,380
6054	Vulcan.....	Lucas.....	Siliceous limestone.....	25,480
6057	Holland.....	do.....	Argillaceous limestone.....	19,430
8402	Toledo, 10 miles west of.....	do.....	Dolomite.....	11,600
6052	White Rock.....	Ottawa.....	do.....	16,620
5556	Bloomville.....	Seneca.....	Limestone.....	20,250
5555	Middleport.....	Van Wert.....	Dolomite.....	25,200

OKLAHOMA.

3388	Granite.....	Greer.....	Granite.....	18,000
------	--------------	------------	--------------	--------

¹ Exact locality not known.

TABLE II.—Results of compression tests of rock, made prior to Jan. 1, 1916—Continued.

PENNSYLVANIA.

Serial No.	Locality.	County.	Name.	Crushing strength, pounds per square inch.
5602	Hyndman.....	Bedford	Impure limestone.....	24, 150
5603	do.....	do.	Siliceous limestone.....	21, 860
5632	Birdsboro.....	Berks	Altered diabase.....	39, 215
8724	Juniata.....	Blair	Argillaceous limestone.....	15, 480
8725	(1).....	do.	do.....	20, 880
8625	Hazard.....	Carbon	Blast-furnace slag.....	9, 000
7973	(1).....	Chester	Proxene quartzite.....	31, 800
7978	(1).....	do.	Mica schist.....	23, 500
7979	(1).....	do.	do.....	23, 900
5578	Salona.....	Clinton	Argillaceous limestone.....	18, 710
7844	(1).....	Dauphin	Siliceous limestone.....	26, 500
8306	(1).....	do.	Limestone.....	8, 510
8427	(1).....	do.	do.....	19, 250
8465	(1).....	do.	Siliceous dolomite.....	9, 640
8049	(1).....	Elk	Ferruginous sandstone.....	14, 150
5771	Indian Creek Station.....	Fayette	Calcareous sandstone.....	37, 740
6097	Bidwell.....	do.	Limestone.....	13, 450
9347	Connellsville.....	do.	do.....	26, 050
5604	Water Street.....	Huntingdon	Feldspathic sandstone.....	22, 330
5557	Walford.....	Lawrence	Limestone.....	27, 500
6153	Porter Township.....	Lycoming	Argillaceous limestone.....	28, 580
6154	do.....	do.	do.....	26, 860
6155	do.....	do.	do.....	18, 610
6156	do.....	do.	do.....	22, 930
6157	do.....	do.	Limestone.....	21, 900
6158	do.....	do.	do.....	14, 160
7980	Port Allegheny.....	McKean	Feldspathic sandstone.....	9, 680
8022	(1).....	(1).....	Ferruginous sandstone.....	12, 130
8023	(1).....	(1).....	do.....	14, 000
8024	(1).....	(1).....	do.....	12, 480
3243	McSpadden.....	Somerset	Sandstone.....	26, 900
5605	Prompton.....	Wayne	Feldspathic sandstone.....	26, 340
5803	Blairsville intersection	Westmoreland	Siliceous limestone.....	32, 560
7428	York.....	York	Dolomitic marble.....	27, 400

RHODE ISLAND.

8867	Westerly.....	Washington.....	Granite.....	11, 740
8868	do.....	do.	do.	20, 300
8869	do.....	do.	do.	20, 750

SOUTH CAROLINA.

8389	Williamstown.....	Anderson.....	Granite.....	12, 990
5568	Rion.....	Fairfield.....	do.....	29, 180
5586a	do.....	do.	do.	25, 790
5586b	do.....	do.	do.	19, 240
5586c	do.....	do.	do.	33, 880

TENNESSEE.

5597	Quarry.....	Carter.....	Limestone.....	22, 750
5502	Straw Plains.....	Jefferson.....	do.....	21, 730
5504	do.....	do.	do.	28, 340
5503	do.....	do.	Dolomite.....	38, 070
6533	Knoxville.....	Knox.....	Marble.....	17, 970

VERMONT.

5543	East Wallingford.....	Rutland.....	Altered diabase.....	16, 800
8853	Barre.....	Washington.....	Granite.....	19, 560

1 Exact locality not known.

TABLE II.—Results of compression tests of rock, made prior to Jan. 1, 1916—Continued.

VIRGINIA.

Serial No.	Locality.	County.	Name.	Crushing strength, pounds per square inch.
8804	Albert.....	Bedford.....	Granite gneiss.....	13, 820
6796	(1).....	Dinwiddie.....	Granite.....	13, 150
4900A	Broad Run.....	Fauquier.....	Quartz.....	28, 400
4900B	do.....	do.....	Epidosite.....	28, 000
5923	Strathmore.....	Fluvanna.....	Chlorite epidote schist.....	13, 210
5678	Eggleston (near).....	Giles.....	Dolomite.....	45, 090
5924	Boscobel.....	Goochland.....	Granite gneiss.....	13, 550
6615	Korah Station.....	Henrico.....	Biotite granite.....	20, 300
5925	Greenway.....	Nelson.....	Feldspathic quartzite.....	16, 500
5492	Nokesville.....	Prince William.....	Ferruginous sandstone.....	17, 780
5920	Greenlee.....	Rockbridge.....	Dolomitic marble.....	36, 900
5382	Bluff Water Station.....	Rockingham.....	Limestone.....	21, 450
5385	do.....	do.....	do.....	40, 850
5375	St. Paul.....	Russell.....	do.....	17, 600
7217	Burkes Garden.....	Tazewell.....	Dolomitic sandstone.....	21, 500

¹ Exact locality not known.

WEST VIRGINIA.

5365	Berkeley.....	Berkeley.....	Limestone.....	23, 350
5917	Renick.....	Greenbrier.....	Crystalline limestone.....	21, 300
5918	Frazier.....	do.....	Limestone.....	17, 450
5919	Snow Place.....	do.....	do.....	13, 550
7475	Green Spring (east of).....	Hampshire.....	Siliceous limestone.....	34, 400
7476	do.....	do.....	Quartzite.....	15, 050
6109	Spring Hill.....	Kanawha.....	Sandstone.....	12, 400
9132	Fairmont.....	Marion.....	do.....	5, 420
9133	do.....	do.....	do.....	5, 720
9134	do.....	do.....	do.....	6, 080
5610	Sturgisson.....	Monongalia.....	Siliceous limestone.....	22, 440
5612	do.....	do.....	Limestone.....	17, 910
5613	do.....	do.....	Argillaceous limestone.....	14, 300
5614	do.....	do.....	Calcareous sandstone.....	29, 840
5615	do.....	do.....	Impure limestone.....	19, 650
5616	do.....	do.....	Argillaceous limestone.....	24, 850
8447	Parkersburg.....	Wood.....	Feldspathic sandstone.....	11, 910

WISCONSIN.

5523	Pebbles.....	Fond du Lac.....	Dolomite.....	32, 600
3418	Amberg.....	Marinette.....	Biotite granite.....	20, 000
8656	Lannon.....	Waukesha.....	Dolomite.....	23, 020

TABLE III.—Geographical distribution of rock samples tested to Jan. 1, 1918.

Alabama.....	32	Kansas.....	33	New Jersey.....	82	Utah.....	13
Arizona.....	4	Kentucky.....	47	New Mexico.....	1	Vermont.....	55
Arkansas.....	20	Louisiana.....	8	New York.....	155	Virginia.....	439
California.....	103	Maine.....	103	North Carolina.....	162	Washington.....	213
Colorado.....	28	Maryland.....	126	Ohio.....	173	West Virginia.....	193
Connecticut.....	56	Massachusetts.....	220	Oklahoma.....	52	Wisconsin.....	154
Delaware.....	31	Michigan.....	97	Oregon.....	14	Wyoming.....	3
Florida.....	13	Minnesota.....	21	Pennsylvania.....	625	Canada.....	55
Georgia.....	272	Mississippi.....	14	Rhode Island.....	43	Cuba.....	4
Idaho.....	10	Missouri.....	43	South Carolina.....	33	Porto Rico.....	12
Illinois.....	134	Montana.....	4	South Dakota.....	15		
Indiana.....	185	Nebraska.....	12	Tennessee.....	85		
Iowa.....	25	New Hampshire.....	34	Texas.....	69		
						Total.....	4, 325

TABLE IV.—*General limiting test values for broken stone.*

Type of construction.	Traffic. ¹	Limiting values.		
		French coefficient of wear.	Toughness.	Hardness.
Water-bound macadam, plain or with dust palliative treatment.	Light.....	5 to 8.....	5 to 9.....	10 to 17.
	Moderate.....	9 to 15.....	10 to 18.....	14 or over.
Macadam with bituminous carpet.....	Heavy.....	16 or over..	19 or over..	17 or over.
Bituminous macadam with seal coat....	Light to moderate.....	5 or over..	5 or over..	(2)
	Moderate to heavy.....	7 or over..	10 or over..	
Bituminous concrete.....	Light to moderate.....	7 or over..	7 or over..	(2)
	Moderate to heavy.....	10 or over..	13 or over..	
Binder course for sheet asphalt or Topeka type.	Any.....	7 or over..	6 or over..	(2)
Portland cement concrete.....	Moderate to heavy.....	7 or over..	8 or over..	
Stone paving block ³	Any.....	8 or over..	9 or over..	16 or over.
Broken-stone foundations.....	} do.....	3 or over..	3 or over..	8 or over.
Cement-concrete foundations.....				

¹ Light traffic is assumed as less than 100 vehicles per day, moderate traffic between 100 and 250 vehicles, and heavy traffic over 250 vehicles per day.

² Numerous tests have shown that limits for hardness are unnecessary if the material possesses the required French coefficient of wear and toughness.

³ Crushing strength, 20,000 pounds or over per square inch, is frequently required.

Cementing values should in all cases show over 25 if material is to be used in water-bound macadam construction.

Granites, gneisses, schists, sandstones, and quartzites should not, in general, be used in the wearing course of water-bound macadam roads. Shales and slates should never be used in this connection. Cementing value tests have therefore been discontinued on these materials.

For further details and explanation of results in this table and also for tests on all materials to January 1, 1916, see United States Department of Agriculture Bulletin No. 370.

PUBLICATIONS OF THE U. S. DEPARTMENT OF AGRICULTURE RELATING TO ROAD IMPROVEMENTS.

AVAILABLE FOR FREE DISTRIBUTION BY THE DEPARTMENT.

- Road Models. (Department Bulletin 220.)
- Portland Cement Concrete Pavements for Country Roads. (Department Bulletin 249.)
- Progress Reports of Experiments in Dust Prevention and Road Preservation, 1914. (Department Bulletin 257.)
- Methods for the Examination of Bituminous Road Materials. (Department Bulletin 314.)
- Methods for the Determination of the Physical Properties of Road-Building Rock. (Department Bulletin 347.)
- Brick Roads. (Department Bulletin 373.)
- Economic Surveys of County Highway Improvement. (Department Bulletin 393.)
- Progress Reports of Experiments in Dust Prevention and Road Preservation, 1915. (Department Bulletin 407.)
- Convict Labor for Road Work. (Department Bulletin 414.)
- Earth, Sand-Clay, and Gravel Roads. (Department Bulletin 463.)
- Results of Physical Tests of Road-Building Rock in 1916, Including All Compression Tests. (Department Bulletin 537.)
- The Results of Physical Tests of Road-Building Rock in 1916 and 1917. (Department Bulletin 670.)
- Sand-Clay and Burnt-Clay Roads. (Farmers' Bulletin 311.)
- Macadam Roads. (Farmers' Bulletin 338.)
- Benefits of Improved Roads. (Farmers' Bulletin 505.)
- Road Drag and How It Is Used. (Farmers' Bulletin 597.)
- Rules and Regulations of Secretary of Agriculture for Carrying Out Federal Aid Road Act. (Circular 65, Office of the Secretary.)

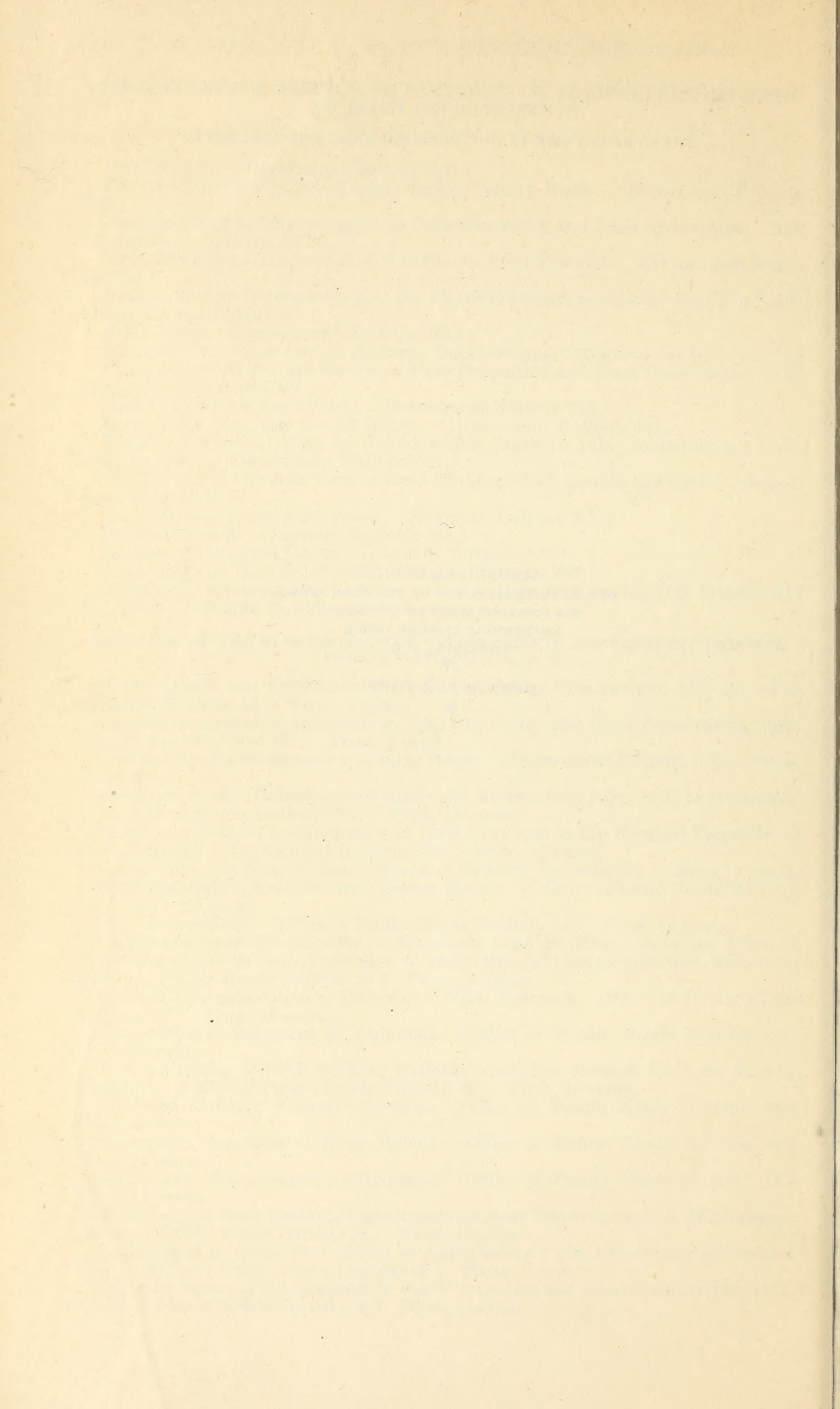
FOR SALE BY THE SUPERINTENDENT OF DOCUMENTS, GOVERNMENT PRINTING OFFICE, WASHINGTON, D. C.

- Object Lesson and Experimental Roads and Bridge Construction, 1912-13. (Department Bulletin 53.) Price, 5 cents.
- Progress Reports of Experiments in Dust Prevention and Road Preservation, 1913. (Department Bulletin 105.) Price, 5 cents.
- Vitrified Brick Pavements for Country Roads. (Department Bulletin 246.) Price, 10 cents.
- Construction and Maintenance of Roads and Bridges from July, 1913, to December, 1914. (Department Bulletin 284.) Price, 10 cents.
- Relation of Mineral Composition and Rock Structure to the Physical Properties of Road Material. (Department Bulletin 348.) Price, 10 cents.
- Use of Split-Log Drag on Earth Roads. (Farmers' Bulletin 321.) Price, 5 cents.
- Road Materials of Southern and Eastern Maine. (Office of Public Roads Bulletin 33.) Price, 20 cents.
- Dust Preventives. (Office of Public Roads Bulletin 34.) Price, 15 cents.
- Examination and Classification of Rocks for Road Building, Including Physical Properties of Rocks with Reference to their Mineral Composition and Structure. (Office of Public Roads Bulletin 37.) Price, 15 cents.
- Methods for Examination of Bituminous Road Materials. (Office of Public Roads Bulletin 38.) Price, 10 cents.
- Road Material Resources of Minnesota. (Office of Public Roads Bulletin 40.) Price, 10 cents.
- Physical Testing of Rock for Road Building, Including Methods Used and Results Obtained. (Office of Public Roads Bulletin 44.) Price, 15 cents.
- Oil-Mixed Portland Cement Concrete. (Office of Public Roads Bulletin 46.) Price, 10 cents.
- Descriptive Catalogue of Road Models. (Office of Public Roads Bulletin 47.) Price, 15 cents.
- Repair and Maintenance of Highways. (Office of Public Roads Bulletin 48.) Price, 15 cents.
- Bitumens and Their Essential Constituents for Road Construction and Maintenance. (Office of Public Roads Circular 93.) Price, 5 cents.
- Naphthalene in Road Tars: Effect of Naphthalene Upon Consistency of Refined Tars. (Office of Public Roads Circular 96.) Price, 5 cents.
- Progress Reports of Experiments in Dust Prevention and Road Preservation, 1912. (Office of Public Roads Circular 99.) Price, 5 cents.

ADDITIONAL COPIES
OF THIS PUBLICATION MAY BE PROCURED FROM
THE SUPERINTENDENT OF DOCUMENTS
GOVERNMENT PRINTING OFFICE
WASHINGTON, D. C.

AT
5 CENTS PER COPY





NATIONAL AGRICULTURAL LIBRARY



1022829783